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Mosaic Patterns of

American Children

MOSAIC PATTERNS OF AMERICAN CHILDREN

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FOREWORD BY MARGARET LOWENFELD

WITH 191 MOSAICS IN FULL COLOR AND 50 TABLES

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CONTENTS

FOREWORD *by Margaret Lowenfeld* ix
ACKNOWLEDGMENTS xii

Part One · **INTRODUCTION**

CHAPTER 1. INTRODUCTION 3
CHAPTER 2. SUBJECTS, MATERIAL, METHODOLOGY 9
CHAPTER 3. LITERATURE 14

Part Two · **CLASSIFICATION**

CHAPTER 4. TYPE OF STRUCTURE 47
CHAPTER 5. FORM LEVEL 55
CHAPTER 6. COLOR 63
CHAPTER 7. NAMING 75
CHAPTER 8. OTHER FORMAL PROPERTIES OF PRODUCTS 80

Part Three · **DEVELOPMENTAL CHANGES**

CHAPTER 9. TWO YEARS 91
CHAPTER 10. THREE YEARS 96
CHAPTER 11. FOUR YEARS 102
CHAPTER 12. FIVE YEARS 108
CHAPTER 13. SIX YEARS 114
CHAPTER 14. SEVEN YEARS 120
CHAPTER 15. EIGHT YEARS 126
CHAPTER 16. NINE YEARS 134
CHAPTER 17. TEN YEARS 141
CHAPTER 18. ELEVEN YEARS 147
CHAPTER 19. TWELVE YEARS 153
CHAPTER 20. THIRTEEN YEARS 159
CHAPTER 21. FOURTEEN YEARS 165

CHAPTER 22. Fifteen Years 171
CHAPTER 23. Sixteen Years 177
CHAPTER 24. Developmental Changes in Specific Products 215

Part Four · **INDIVIDUAL DIFFERENCES**

CHAPTER 25. Longitudinal Survey of Individual Subjects 241
CHAPTER 26. Sex Differences 246

Part Five · **DISCUSSION AND SUMMARY**

CHAPTER 27. Discussion 259
CHAPTER 28. Summary 269

References 284
Index 287

LIST OF COLOR PLATES AND TABLES

COLOR PLATES following page 180

Illustrations of mosaic patterns typical for each age level

1. Two Years
2. Three Years
3. Four Years—Girls
4. Four Years—Boys
5. Five Years
6. Six Years
7. Seven Years
8. Eight Years—Girls
9. Eight Years—Boys
10. Nine Years
11. Ten Years
12. Eleven Years
13. Twelve Years

14. Thirteen Years—Girls
15. Thirteen Years—Boys
16. Fourteen Years
17. Fifteen Years
18. Sixteen Years
19. Basic Fundamental Forms Made from Various Shapes
20. Slabs—Typical at Increasing Ages
21. Houses—Typical at Increasing Ages
22. Trees—Typical at Increasing Ages
23. Flowers—Typical at Increasing Ages
24. People—at Increasing Ages (5–9 Years)
25. People—at Increasing Ages (10–15 Years)
26. Scenes—at Increasing Ages (3½–10 Years)
27. Scenes—at Increasing Ages (11–16 Years)
28. Longitudinal Individual Case, Girl B. I.
29. Longitudinal Individual Case, Boy D. C.
30. Longitudinal Individual Case, Boy D. J.
31. Longitudinal Individual Case, Boy D. G., Gifted Boy
32. Longitudinal Individual Cases, Neurotic Products (a–c) and Gifted Products (d–f)

TABLES

1. Intelligence Rating Distribution 9
2. Occupational Scale Distribution of Fathers 10
3. Extent to which Individual Subjects Were Seen at More Than One Age 10
4. Age Stages According to Lowenfeld 15
5. Six-Year-Old Patterns 16
6. Eighth-Grade Subjects 17
7. Age Changes in Pattern, Four to Eighteen Years 18
8. Classification of Mosaic Designs 24
9. Wideman's Scoring Categories 26
10. Characteristics of Normal, Schizophrenic, Neurotic, and Organic Subjects 37
11. Comparison of English and American Products 40
12. Chief Mosaic Indications of Various Individuality Characteristics 43
13. Type of Structure 48 and 49
14. Form Level, Nonrepresentational Products, Number of Subjects at Each Level 56
15. Form Level, Representational Patterns, Number of Subjects at Each Level 58
16. Extent to which Different Shapes Are Used (Average of Percentages), Girls 61

17. Extent to which Diffeernt Shapes Are Used (Average of Percentages), Boys 61
18. Use of Color in Nonrepresentational Designs, Number of Subjects in Each Category 64
19. Use of Color in Representational Designs, Number of Subjects in Each Category 65
20. Percentage of Total Number of Pieces Used, in Each Color (Figured by Individual Children) 66
21. Number of Subjects Using One Color Only or Three Colors or Fewer 70
22. Manner of Naming 76
23. Naming of Products 78 and 79
24. Average Number of Pieces Used per Child at Each Age 80
25. Time in Minutes Required for Each Child to Complete His Product 82
26. Symmetric Placement of Figures on Paper 83
27. Symmetry of Figure 83
28. Compactness of Design, Girls, Number of Designs at Each Level of Compactness 85
29. Compactness of Design, Boys, Number of Designs at Each Level of Compactness 86
30. Success or Lack of Success in Central Design 89
31. Tabular Summary, Age Changes in Slab Patterns 216 and 217
32. Mean Number of Shapes and Colors Used 219
33. Number of Pieces Used in Slabs 219
34. Size of Slab Patterns 220
35. Fitting of Pieces in Slab 222
36. Centers 226
37. Developmental Stages in Construction of Houses 227
38. Houses 228
39. Further Detail of Age Changes in House Structure 229
40. Trees, Tabular Summary of Leading Patterns 230 and 231
41. Kinds of People Constructed 232
42. Naming Persons 233
43. Number of Scenes, and Mean Number of Pieces per Scene 234
44. Qualitative Description of Scenes 235, 236, 237
45. Masculine and Feminine Content, by Name 249
46. Diamond-Shaped and Phallic Rocket-Shaped Figures 250
47. Adjacent Age Comparison of Outstanding Mosaic Patterns: Number of Subjects Showing Each Pattern 261
48. Type of Mosaic Structures Made by Elderly Subjects 264
49. Responses Considered by Some Investigators to be Abnormal in Adults, Which Occur Normally at Certain Ages in Children 266
50. Supposed Danger Signals in Children 267

FOREWORD

This is a courageous book, breaking new ground. It reports the results of the submission of 1500 children, aged from 2 through 16, with whom the Gesell Institute has been in touch for many years, to the Lowenfeld Mosaic test.

The plan of the work is a year-by-year analysis of the material and a comparison of the developmental findings invested in this cross section with some longitudinal studies of individual children.

In this work the authors have laid foundations for a basic outline of developmental changes in boys and girls, as shown in response to a defined stimulus—the manipulation of a standard set of colored geometric shapes. They give us, at the same time, a detailed study of American children.

It is this aspect of the work that first strikes a European reader, for in many ways, in their attitudes and reactions, these children differ strikingly from British children, whose responses formed the basis of my own work on developmental changes as reflected in Mosaic designs.

Being nonverbal, the Mosaic test is free from semantic difficulties, since what the child *does* with the material offered, the design he makes, constitutes his response. Since the designs made are directly reproducible, they can be studied from many different angles, and can be reassessed, if desired, at a future date.

The differences, therefore, that appear in this book, both in the attitude of the investigators to the material and in the material itself, open up fascinating avenues of thought. Detailed studies of subjects from a relatively homogeneous background, such as are reported in this book, make possible a careful comparison of the responses of children of the same ages who live and function within different cultures. From such a study the hope arises that it may become possible, in the future, to separate reactions which are truly developmental from those which arise from cultural influences. What is needed, and is so far lacking, is a study on a comparable scale of non-American children of the same age range, living within a different major culture.

The mode of analysis of the material from the New Haven children and the study of the responses themselves, as far as they can be deduced from the text, extend our knowledge both of the possibilities latent in the test and of possible reactions in children from dissimilar backgrounds. For example, of such differences in reaction, let us take the attitudes of children to the test itself and to what they do with the test material. Judging from extracts from recordings of the test interviews, the children studied are acutely conscious of themselves as "people being tested"; they are anxious about the impression they are making, talk about what they should be accomplishing with the material, tease the observer in a mocking semihumorous way, and seem often dissatisfied with themselves and doubtful of the worth of their design, or defensive about it.

Such reactions differ considerably from those of European children. On the whole, British children talk very little while making their designs, and I cannot remember an instance of the sort of self-observing, self-critical conversation that, to the investigators reporting in this book, seems to be natural and expected. When English children do talk while working with the pieces, it may be *to* the pieces, or *about* the pieces, or to explain to the observer *why* they are placing the pieces where they are being put. When the design is finished, a certain proportion of English children enjoy discussing it with the observer, but again, on a factual level. It is often difficult to give an interpretation, should it be thought wise to do so, because the idea of a definite connection between what they have done and any aspects of themselves is an unfamiliar one.

A second interesting difference appears when the question of the child's attitude to the pieces is considered. British children are directly interested in the pieces; they are "taken" with the colors and enjoy the opportunity to experiment with them, are intrigued by the shapes and interested in the effects that can be produced with them. Much greater persistence in working out interactions between the pieces occurs than seems to be the case with the children studied in this book. British children's use of the pieces can be very exact, as shown, for instance, in Plates 5 and 9 of the collection of plates reproduced for the *Lowenfeld Mosaic Test* book. With the New Haven children this interest in the qualities of the pieces seems to occur only in the younger children and to disappear in later years. With British children the reverse is the case.

This different attitude toward the interrelations of the pieces finds expression also in the proportional distribution of representational and nonrepresentational designs. The difference in the distribution of these in American and British children has already been observed by Stewart and Leland, and the far greater proportion of representational designs in American children has been noted. The figures from the New Haven children support their findings.

Perhaps the most profound and most interesting difference, however, appears in relation to the question of symmetry. Here, both in the attitude of the investigators and in the reactions of the children, a marked difference is noticeable. When assessing the designs collected at this side of the Atlantic, I wrote in 1954 that the vast majority of the patterns made by normal subjects are compact symmetrical patterns, and although this is not true of children to the same extent, symmetrical compact patterns still remain the dominant type.

This situation seemed so obvious to me, when writing, that an implicit assumption underlay much of my own analysis; namely, that the achievement of symmetry as an aim was to be taken for granted. In the studies in this book, a quite different picture emerges. In Chapter 8, when discussing symmetry, it is stated that "the peak point of symmetry is reached at 14 years when 50 per cent of the subjects make symmetrical figures." This implies that, for the majority of children studied, the frequency of symmetry will be in the reverse direction, which is a most interesting finding. The appearance of slabs at all ages supports this difference of attitude. Although the section dealing with the nature of slab constructions throws some light on this phenomenon, yet, as the authors agree, much still remains to be explained.

Looking at the question of symmetry from the opposite point of view and combining that of compactness with it, in the studies carried out in England it was found that much could be learned from careful study of symmetrically constructed compact patterns, as they appeared at different ages, concerning inherent intellectual endowment and maturational level. The comparative infrequency of this type of design in the New Haven children is associated with a scheme of developmental analysis of form which arises from different material and a different point of view. It is not possible, therefore, to arrive at satisfactory comparisons on this point. Factors as yet unknown underlie this thought-provoking and interesting difference in attitude to form, and it is to be hoped that the authors will, in the future, put us still more in their debt by a further analysis of their material along the lines which have emerged from the study of European material.

Another element with a very different frequency in the two types of collections is that of humor. In responses from English children, humorous designs, such, for example, as shown in Plate 6 in my book, are not uncommon. None of this type was apparently made by the New Haven children.

A valuable feature of this book is the inclusion of longitudinal studies of individual children to balance the tables of mean values of different qualities selected for analysis at each age level. These studies are of considerable interest, since they show how individual a series of responses to the test can be. Some of these studies support also the suggestion, put forward by myself some years ago, of the possibility of persistence in a given individual of identical types of response for many years, even, as given in one instance here, the persistence of an identical pattern.

It is a pleasure to have so massive a collection of information to study as is presented in this book, and it is to be hoped that the many interesting points raised will inspire workers on this side of the Atlantic to carry out comparable investigations. The authors are greatly to be congratulated for their patience and thoroughness in the creation of this basic piece of work, for the originality of their approach, the variety of the material, and the range of their survey.

MARGARET LOWENFELD

London

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Our foremost acknowledgment goes to the many children, parents, and teachers whose patient cooperation made possible the gathering of these records, in some instances year after year. The teachers and schools to whom we wish to give special thanks include Mrs. John Martinson and Mr. Stephen K. Lovett of the Norwalk, Connecticut, public schools; Principal Edward Summerton, formerly of the Hurlbutt School in Weston, Connecticut; Mrs. Pauline Olsen of the New Canaan, Connecticut, Country Day School; and the staff of the Hamden Country Day School in New Haven, Connecticut.

Among the many colleagues who helped us in the gathering and analysis of records in the more than 10-year period during which this work was in progress, grateful acknowledgment is made to Dr. Richard N. Walker, Dr. Janet Rodell, Miss Elizabeth Binz, Dr. Evelyn Goodenough, and Mrs. Marjean Kremer.

We are, as always, deeply grateful to the late Dr. Arnold Gesell, whose developmental philosophy has proved as useful a base for the analysis and understanding of projective phenomena as for more concretely physical manifestations of behavior.

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L. B. A.
F. L. I.

Part One

INTRODUCTION

CHAPTER 1

Introduction

Lowenfeld has described her Mosaic test (L.M.T.) as giving evidence of the way in which the individual performs, or meets life situations, in contrast to the Rorschach, which gives evidence of the manner in which he perceives. Colm makes a similar distinction, noting that "while the Rorschach provides an opportunity to see the personality in reaction to complex intellectual and emotional stimuli, the Mosaic provides a greater opportunity to observe in a quick and direct way, the personality in *spontaneous* action" (1948, p. 232).

These two tests supplement each other in giving a well-rounded view of the individual. In clinical practice we have found their joint use most effective. Thus a child, whose basic individuality as judged by the Rorschach may be somewhat meager, may nevertheless on the Mosaic, as in everyday life, give an adequate, effective performance.

Though experimental evidence which would support our clinical judgment is so far largely lacking, it begins to seem that the Mosaic test may be one which correlates more closely with actual observed performance than do such well-known and widely used tests as the Rorschach and the usual intelligence test.

Hannah Colm's experience with the Mosaic (1948, p. 232) confirms our own. She notes that:

> . . . the Mosaic is often the only test which gives some clue as to the child's genuine intelligence. The Binet result may show poor intellectual functioning, with factors suggestive of unevenness in functioning, while the Rorschach merely shows the vast emotional disturbance blocking intellectual functioning. In these cases, a dynamic design made with the Mosaic tiles gives a greater indication of the child's genuine endowment.

That some apparently well-endowed children do perform poorly, and vice versa, remains a continually perplexing problem. Why is it that some children with presumably good endowment (high I.Q. and apparently favorable individuality factors) do so poorly in life situations? Why do others, with apparently a less good endowment, perform effectively? (We assume here that environmental factors in both instances are uniformly favorable.)

We can say that motivational, or organizational, factors are involved, but this really explains little. Far as we seem to be, at the moment, from a real explanation, a first step, which perhaps needs to precede an explanation, is to arrive at some test or method which will measure or predict adequacy of performance as separate from mere adequacy of endowment.

That performance frequently does turn out to be better or worse than customary test results (including intelligence test results) would predict is particularly true in the school situation. Preliminary research aimed at setting up school readiness tests which will accurately predict school performance (Ilg, Ames, and Apell, in prep.) suggests that the Mosaic test may possibly correlate better with other effective tests and with later school performance than does the Rorschach. In this context the Mosaic appears to be extremely useful in indicating "the manner in which the child behaves in ordinary and extraordinary circumstances" and in providing "a means of assessing the ability of different individuals to make a creative use of standardized material and to respond to new situations" (Lowenfeld, 1954, p. 23).

Our own observations suggest that the Mosaic may also be useful in making the important distinction between developmental age (age at which an individual functions as a total organism) and intellectual age; that is, the distinction between his developmental quotient (D.Q.) and his intelligence quotient (I.Q.).

The Mosaic test has proved to be popular with both child and adult subjects, as well as with many psychologists, and it is at present widely used in both the United States and Canada as well as in Europe. The fact that it is not more widely used may, at least in part, be due to the lack of adequate scoring, norms, or standards by which to judge performance. In spite of Lowenfeld's exhaustive and excellent classification of Mosaic products (1954), we still lack, particularly for the productions of children, clear, definitive age norms which would permit a clear-cut evaluation of what the individual has produced.

Lowenfeld herself appears to be of the opinion that a mere counting of pieces—in fact, any mere quantitative treatment of the Mosaic data—is not only useless but is strictly undesirable, since proper evaluation of any given product requires not so much counting, or matching to some previous standard, as immediate global evaluation by the examiner. She states (1954, p. 27):

> The results are capable neither of statistical assessment nor of verbal evaluation in the current terms. For those, therefore, to whom verbal and statistical assessment are synonymous with the acquisition of accurate knowledge about a complex phenomenon, the L.M.T. cannot fail to be an irritation. [She comments further:] The essential nature of the L.M.T. lies in its use as a tool of exploration. By the correct use of it one can "escape from the bondage of asking only the questions that are based on our own and other known civilizations" (Mead, 1949, p. 45).

Our presentation, which emphasizes developmental changes in the Mosaic product, is in no way an attempt to substitute mere age identification of any given product for Lowenfeld's basic intention for the Mosaic test—that it should disclose to us various facets of the individual's personality and, particularly, give us information about his power to perceive and to manipulate accurately objects of defined shape, as well as knowledge about the way he performs in a new situation.

It is our opinion, however, that before we can properly evaluate the unique implications of any given product as to the individuality of any given subject, particularly in the rapidly changing period of childhood, it is necessary to view that product against the background of what children of different ages customarily produce. As in our own earlier treatment of the Rorschach test in children (Ames *et al.*, 1952, 1959), it seems to us that, in any study of the child's performance on any projective test, we must at all times keep in mind not only the maturity changes which he undergoes but also the enduring consistent thread of his own individuality. We have found that in regard to many functions—the Lowenfeld Mosaic test performance among others—there are certain sectors of the life span when maturity factors are so all-pervasive that the unique individuality pattern of any one child cannot always be clearly discerned. It is presumably always present, but at certain ages it appears to be overlaid, and to some extent obscured, by age factors.

Thus at the earliest ages, the 3-year-old Mosaic performance with its scattered single pieces, or the 4-year-old basic circle made of 6 large triangles, appears to show us more about the age at which the child is functioning than to tell us anything unique about his own special individuality. As the child grows older, perhaps from 7 years through 14 or 15, individuality factors become increasingly apparent. Later on, perhaps in the late teens or early twenties, age factors no longer conspicuously affect performance, and individuality factors may be considered to determine behavior.

The present volume gives our findings on age changes in the Mosaic product at yearly intervals for the period between 2 and 16 years of age, boys and girls separately, for 100 normal American subjects at each age level. These age portraits have been arrived at in two ways—quantitatively and qualitatively. In our quantitative analysis we have determined the mean and median changes in the various formal properties of Mosaic products, such as the form level and actual shapes used at different ages, the use of color and the actual colors used, the level of naming and the actual content of products, compactness, and such other factors as the number of pieces used, timing, symmetry of the product, and general attractiveness of the product.

In our qualitative analysis we have followed more closely Lowenfeld's approved methods of evaluating products. According to her:

> An understanding of the L.M.T. is gained through detailed analysis of the structure of the responses in their two aspects: the relation of the subject, as an individual, to the test, and the study of the design made by him. The essential of the process of scoring is the division of test results into categories already known to the tester, and the purpose of the scoring is that the relative proportions and modes of distribution of these known categories as displayed in the test under examination shall be compared with similar data obtained through the administration to the same subjects of other forms of tests [1954, p. 45].

Thus, in our qualitative evaluation, we have particularly given emphasis to productions which, although they may not appear in anything like a majority of a given population, seem to us to bear out or illustrate kinds of behavior which subjects show on other tests, or which earlier investigations have indicated to be characteristic of certain ages (Gesell and Ilg, 1946, 1956, and Ames *et al.*, 1952, 1959).

The Lowenfeld Mosaic test, easy to give and extremely rewarding in clinical use, is nevertheless somewhat baffling as the subject of scientific study, particularly when the determination of clear-cut age trends is the object of such study. The effort to determine age factors is in itself somewhat paradoxical, since the purpose of the Mosaic test is to reveal the ways in which any given subject expresses his unique individuality rather than to show the ways in which he is like others who are chronologically at the same level.

Our earlier research with the Rorschach (Ames *et al.*, 1952, 1959), however, indicates that, unless the responses which are primarily characteristic of age are first identified, they are likely to be confused with responses which are more unique to the individual in question, and thus may be given too much weight as indicators of personality. Furthermore, in longitudinal studies of the Mosaic in which the same subject is tested year after year, it can be observed that the response of any one individual often changes strikingly from one age to another, even though we may assume that his basic individuality is remaining more or less constant. Thus we may hypothesize that age as well as individuality factors contribute to determine the pattern of any given Mosaic response.

We have for many years, along with our clinical use of the Mosaic test, carried on the task of attempting to identify age factors. This has proved to be most difficult. Although we can say that many 3-year-olds merely scatter pieces on the board, many Fours seem characteristically to make a fundamental circle made up of 6 large triangles, many Sixes make large outdoor scenes with sky and earth dramatically separated, Sevens tend to make linear designs, Elevens construct many small separate figures, and Thirteens make small enclosed circles, it is also true that variations from any such basic scheme are as numerous as adherences to it. When we consider the specific shapes used most, there appears to be a conspicuous tendency in both sexes for predominance of the large triangle during preschool ages, followed by use of the square and then, in the teens, the predominant use of the diamond. But here again, exceptions are numerous. Suggestive age trends as to color preference have also been identified, but here also exceptions may almost be said to prove the rule.

Nevertheless, in spite of the difficulty of establishing clear-cut age trends, the search for them appears to be well worthwhile, if only to remind the clinician that age as well as individuality factors seem to be at work in determining the child's product at any given time, and that sheer maturity (or immaturity) factors must always be considered before we attribute too much, of a personality import, to the scattered product of the 3-year-old or the small compact figure which a Nine or a Thirteen may fashion. When the wide-spreading product of a 12-year-old pulls in at 13, or when the bright gay colors of a Twelve give way, as they do in some subjects, to the single dark color which many use at 13, it is important to keep in mind that such a variation may merely be an indication of an age change and not a sign either that "something has happened" or that the resulting small dark product is uniquely an indication of the basic individuality of its maker.

The tables, graphs, illustrations, and verbal descriptions which are presented in this book will serve, we hope, to convince the reader that, although we cannot present any single standard pattern and say that this is the pattern which the typical child should or will produce, strong and sometimes clear-cut age forces are at work in influencing, even if in not alone determining, what the Mosaic product will be.

In attempting to evaluate the individuality and emotional factors which, presumably, such projective techniques as the Mosaic and Rorschach tests reveal, it is, in our opinion, important to be able to identify the maturity or immaturity of a given subject before proceeding to look for more subtle aspects of his unique personality pattern.

The Mosaic is, potentially, one of the most basic and useful of all the various projective techniques because it can, if properly interpreted, give information about two vital factors: (1) just where an individual is functioning, that is, his maturity level; and (2) something of what his individuality is like—not in potential (as in the case of the Rorschach) but in action.

A careful knowledge of age factors also appears to be essential in properly evaluating the Mosaic, as with the Rorschach test, in view of the fact that, at least to some extent, a process of what we designate "developmental interweaving" (Gesell, 1939; Ames *et al.*, 1959) appears to take place in the Mosaic as in other test responses. Thus behavior in response to this test, as elsewhere, often appears to develop not in what might be termed a straight-line direction but, rather, through successive reorganization of energies, abilities, and interests, with some levels tending to emphasize expansiveness of affect and behavior, others to emphasize inwardizing or even withdrawing tendencies.

In the Mosaic we observe such an alternation of expansive and withdrawal tendencies at such successive ages as 12, 13, and 14, with the characteristic performance being relatively more expansive at 12 and 14 years and more withdrawn and sparse at 13. Without a knowledge of developmental factors and a familiarity with customary age trends, the characteristically sparse performance of many Thirteens might incorrectly be judged as an indication of a meager personality endowment, or as the expression of an individuality which had been adversely affected by environmental forces.

One last area in which age norms may be useful is in cultural differences in test performance. Throughout her book, Lowenfeld emphasizes the marked differences which appear to exist between European and American Mosaic patterns. She states specifically (1954, p. 17): "Owing to the difficulties that the European mind finds in assessing the processes at work in the production of certain types of American patterns, description of scoring methods has been deliberately withheld until adequate information on this point becomes available from American workers." It is our hope that, by indicating specifically the population whose records we have analyzed and by presenting, in tabular form as well as descriptively, the age changes which we have observed, we may facilitate not only the use of the Mosaic with child subjects but also a direct comparison of products of American, European, and other groups of subjects of widely differing cultural backgrounds.

CHAPTER 2

Subjects, Material, Methodology

SUBJECTS

The subjects for the present study (50 girls and 50 boys at each yearly age level 3 through 16 years and 25 girls and boys each at 2 years) were drawn from several different populations. The majority were either children in our own Guidance Nursery at the time they were tested or were former nursery-school subjects who, as they grew older, constituted our basic research group and were given the Mosaic test along with other tests at yearly intervals.

Table 1
INTELLIGENCE RATING DISTRIBUTION

2- to 9-Year-Olds *Rated on a Developmental Scale*			*10- to 16-Year-Olds* *I.Q.'s on Wechsler-Bellevue*		
	Number of			*Number of*	
	Girls	*Boys*		*Girls*	*Boys*
Very superior	39	26	Mean I.Q.	118.04	117.58
Superior	85	68	S.D.	14.25	11.62
High average	50	43	Number having test scores	90.0	97.0
Average	43	21			
Low average	5	3			
Borderline	0	0			
Total	222	161			

This group was supplemented, when necessary to make up the 100 needed at each age, by children from nearby public and private schools. These children were not specially selected but were chosen from lists of presumably "normal" children of the needed ages. Among the schools which provided subjects were the Hurlbutt School in Weston; the New Canaan Country Day School of New Canaan; Hamden Hall and Miss Gailer's School, both of New Haven; the Bassett Junior High and the Norwalk High School of Norwalk—all in Connecticut.

Tables 1 and 2 give data on the intellectual level and the fathers' occupations for all subjects on whom this information is available. This information is presented separately for the 2-to-9- and the 10-to-16-year-old groups. Of the younger subjects, as Table 1 shows, by far the majority were of high average, superior, or very superior intelligence. Of the older subjects (tested individually on the Wechsler-Bellevue) the mean I.Q. for girls is 118.04 (S.D. 14.25); for boys, 117.58 (S.D. 11.62). As to fathers' occupations, for both girls and boys of both age groups, with only a few exceptions, fathers fall in socioeconomic Classes I and II, with the majority in Class I.

Table 2

OCCUPATIONAL SCALE DISTRIBUTION OF FATHERS*

	Of 2- to 9-Year-Olds		*Of 10- to 16-Year-Olds*	
	Girls	*Boys*	*Girls*	*Boys*
Class I, professional	128	134	47	51
Class II, semiprofessional	81	54	29	23
Class III, clerical, retail business, skilled	20	17	5	13
Class IV, farmers	1	0	1	3
Class V, semiskilled	13	6	1	2
Class VI, slightly skilled	1	2	0	0
Totals	244	213	83	92

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* Minnesota Scale of Socioeconomic Status.

As Table 3 indicates, a good many of the subjects were seen at more than one age level, making longitudinal as well as horizontal analysis of data possible in many instances.

Table 3

EXTENT TO WHICH INDIVIDUAL SUBJECTS WERE SEEN AT MORE THAN ONE AGE

	Number of Mosaic Productions	*Number of Different Subjects*
Girls, 2 to 9 years	375	280
Boys, 2 to 9 years	375	244
Girls, 10 to 16 years	350	124
Boys, 10 to 16 years	350	134

MATERIALS

Though slight variations do exist in the various sets of materials which have been used by different workers, we shall describe here only the standard set used by Lowenfeld and by most other workers with this test, including ourselves. This set is obtainable through the Psychological Corporation in New York City.

The set consists of a box of 456 plastic pieces, 1/16 inch thick. These pieces come in five different shapes—square, diamond, and equilateral, right-angled isosceles, and scalene triangles; and in six different colors—black, green, yellow, red, white, and blue.

The dimensions of the pieces were determined in relation to the square: the diamond's sides are equal in length to those of the square; each right-isosceles triangle is equal to half a square. The sides of the equilateral triangle equal the diagonal of the square or the hypotenuse of the right triangle. The scalene triangles are bisected equilateral triangles.

The numbers of each type available are: 8 squares of each color, or 48 squares;

12 equilateral triangles of each color, 72 in all; 16 diamonds of each color, making 96; 16 right isosceles triangles of each color, making 96; and 24 scalenes of each color, or 144.

The working surface on which the patterns are to be made is a sheet of white paper which covers the surface of a rectangular wooden tray having a raised rim on three sides, with the side placed nearest the subject being rimless. The standard size of this working surface is 10¼ by 12⅜ inches.

ADMINISTRATION OF TEST

The subject should be seated before a table on which is placed, directly in front of him, the tray covered with a piece of white paper. The open Mosaic box containing the Mosaic pieces is at his left.

The examiner says, "Here is a box of pieces, all different colors and all different shapes. I want you to make something with some of them on this piece of paper, anything you like. But first I'm going to show you all the different kinds." (If the subject starts right away to reach for one of the pieces, the examiner holds his hand over the box, protecting the pieces as he demonstrates.)

The examiner demonstrates one piece of each kind—equilateral triangle, square, isosceles triangle, diamond, and scalene triangle, in that order. As the examiner holds up the large triangle, he comments, "This comes in all these different colors" (showing). As he holds up the square, he says, "And this, too, comes in all the different colors," and so on for each piece.

After demonstrating and commenting on each shape, the examiner refers to the second half of the box, away from the child: "And here are extra ones in case you need more." (That is, the box is divided into two halves, each containing 228 pieces.) "Now I want you to take some of these pieces out of the box and put them onto the paper and make something, anything you like. You may take as long or as short a time as you like. You may make a big thing or a little thing. And you may use a lot of pieces or just a few. You may start now."

If the subject hesitates, the examiner may encourage him with, "Which one are you going to start with?" Further encouragement is seldom necessary.

The general wording of these instructions will need modification in nonessentials to suit the age of the child, but the essentials which must be retained are that the contents of the box should be explained to the subject, and that the pieces used for demonstration should be put back into the box—not left on the board to serve as a suggestive starting point.

The examiner records as much detail as possible, both as to what the subject does and what he says, as the subject works. If the subject inquires about what the examiner is writing, the examiner answers, "I'm just writing down what pieces you use." The examiner should avoid leading comments such as guessing what the child is making, though he should respond in a friendly way to any comments addressed to him. When the subject asks for pieces not available, such as round pieces or brown pieces, the examiner merely indicates that we do not have those.

When the subject is finished, the examiner says, "Now tell me about what you have made." This should be stated in a friendly and interested way but not in a perplexed manner.

Unless the subject works for more than 20 minutes, he is permitted to take as long as he chooses. Subjects of a research study (as in the present instance) are routinely stopped at the end of 20 minutes if they should still be working, though this is seldom the case. A subject being tested as part of a clinical examination may be permitted to take as long as he needs, and an occasional individual does take as long as 1 hour or even more.

After the subject has finished and has departed, the examiner traces around each Mosaic chip which the subject has placed on the board, indicating its color. The recorded design is then colored with crayons or—our own procedure—pasted over with colored pieces of gummed paper, representing the different shapes and the different colors. This is one of the many advantages of the Mosaic test—that an almost exact replica of the child's own product remains available for later analysis.

PROCEDURE

The test was administered individually* to each subject, according to the instructions for administration just described, and a written record was made as the subject worked. This record covered what the subject did, what he said, and his general attitude toward the test. The products were then traced and colored or pasted to reproduce the design which the subject had made. As stated above, we gathered 100 Mosaic products at each yearly age level from 2 through 16 years of age—50 boys and 50 girls at each age (except at 2 years of age when only half as many tests were gathered as at other ages).

The products were then analyzed as to all formal properties of each response—type of structure, form, color, symmetry, compactness, and content. All the products of each sex at each age were analyzed as to their formal properties, and the results were tabulated.

Following this, the behavior at each separate age level was analyzed and summarized. For each age level we have presented a quantitative summary which indicates the formal properties of structures made at the age. This is followed by a qualitative summary. These qualitative summaries are, to us, one of the outstanding contributions of this study. At every age there occurred certain behaviors which seem outstandingly characteristic for that age. For example, the serial product made of single pieces or single objects lined up horizontally across the board, so frequently observed at 7 years of age, or the hollow dark circle often made at 13 years, are, to us, highly characteristic of those ages. That is, this special type of production fits in with what we have otherwise observed to be the basic characteristics of the age.

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* These tests were gathered over a rather prolonged period. The chief examiners were Louise Bates Ames, Ph.D.; Frances L. Ilg, M.D.; Janet Learned Rodell, Ph.D.; Richard N. Walker, Ph.D.; and Evelyn Goodenough, Ph.D.

The incidence of such patterns at any one age may not be mathematically impressive (individual differences in response to this test are so great that we cannot demonstrate that such characteristic patterns occur in a majority of subjects at any age), but, considering the wide variety of possibilities, it seems significant and striking when even 6 out of 100 subjects at any certain age make an almost identical pattern whose structure suggests other patterns that we have found to be significant at that same age and not significant at adjoining ages.

A developmental table is given for each age, indicating the kinds of response which, from our findings, appear to be "at age" and those which we consider to be "below age."

Sex differences for each age level are also given. Lastly, a composite description of the behavior and verbalization characteristic of the child of each age as he works is presented.

Colored reproductions illustrate outstanding patterns at each age level.

CHAPTER 3

Literature

The literature on the Lowenfeld Mosaic test, though not extensive in comparison with that dealing with such other projective tests as the Rorschach and the Thematic Apperception Test (T.A.T.), is increasing steadily. This literature has already been reviewed comprehensively by Dörken (1952, 1956) and by Walker (1957), and reference is made to these papers.

The available literature deals with many different aspects of the Mosaic test. Here we shall not attempt to review all minor publications on the subject but shall confine ourselves chiefly to studies which discuss children's Mosaics; which suggest systems of classification; which investigate age, sex, and cultural and intellectual differences; or which deal with diagnosis and personality evaluation.

AGE DIFFERENCES

There are in the literature very few references to responses characteristic of specific age levels, and even fewer to age changes which might be expected. The most detailed treatment of developmental changes in the products of children is found in Lowenfeld's chapter, "The Use of the L.M.T. in the Study of Children" (1954, pp. 105–135). A condensed version of her findings is given in Table 4.

Other studies which mention behavior characteristics of any given age are few and scattered. Two of the best are by Stewart and Leland (1955) and Stewart, Leland, and Strieter (1957). The first of these, "Lowenfeld Mosaics Made by First Grade Children," reviews the Mosaics made by "all first grade children in two Long Island schools, selected until a total of 100 had been reached." These boys and girls ranged in age from 5 years 8 months to 7 years 3 months. Thus, though 87 per cent fell within the 6-year group, actually three age levels were represented. Boys' and girls' responses were not treated separately. Intelligence quotients ranged from 75 to 141.

Mosaic patterns made by Stewart and Leland's 100 subjects were classified as in Table 5. A comparison with our own 100 6-year-old products is indicated by the figures under the heading "New Haven Subjects." There is a general

Table 4

AGE STAGES ACCORDING TO LOWENFELD

(Adapted from Lowenfeld, 1954)

2 to 2½ Years:	Subject examines pieces; places them on the tray; may separate them from one another.
3 to 4 Years:	Makes wavering lines composed of single pieces, either side by side or with their points touching. Pieces placed on tray at varying distances from each other. Single pieces placed along edge of tray. Single pieces or groups of pieces may resemble objects—"kite."
3 to 4 Years:	
Next stage:	Pairs of pieces (prefundamentals). Single slabs. Groups of pieces at edge of tray. Use of pieces as if child were drawing.
Next stage:	Combinations of equilateral triangles, for instance. Other experimentation with pieces of basic pairs.
Next stage:	True pattern emerges. (Our 4-year-old circle of 6 equilateral triangles, points toward a focal center).
5 Years:	Designs in which the whole area of the tray plays a part. Pieces not integrated with each other. Rows across much of tray. Frame and item. (According to Lowenfeld, these look more planned than they are. Actually, child places pieces, likes the way they look, and continues.) For objects, the "kite" and the drawing-materials reactions coalesce. Pieces used to block out impressionistic idea of object—"fox." Scene, which child works out as he goes along; not too accurate.
6 Years:	Elaborated fundamental.* Elaborate combinations of pieces into object which child names, though adult doesn't see the resemblance.
7 Years:	New classes of abstract patterns. True intermediate patterns. Small lines of pieces arranged symmetrically on tray. Very few representational patterns.* (If representational patterns are used, they include more pieces than earlier.)
8 Years:	Big, competent, successful abstract patterns. More attention to color than earlier. Usually symmetric. Flowers appear.*
9 Years:	Little that is new, though abstract patterns change. Larger, but the form and construction become conventional. Centered, symmetric, successful. Deliberate use of color to improve pattern. Objects are men, flowers, houses.
10 Years:	All patterns show more definite organization.* Placed centrally. New patterns, as the diamond star* Intermediate patterns with radiating arms. Compact patterns covering whole tray. Representational designs, good; or scene. (Up to now, airplane is the only mechanical object which has appeared.)*
11 Years:	Note conventionality of compact patterns. Regular star or rectangle. No original thought. Circular movement; heavy balanced corner patterns come in. Usual representational. No people.*

Table 4 (*Continued*)

12 Years: Difficulties in manipulating pieces have disappeared. Many successful compact designs placed free in the tray.
Horizontal blocks of patterns to make a large irregular pattern.
New awareness of whole tray.
Discriminating use of color often completely disguises the nature of the central core.

13 Years: New: patterns resembling a capital H, that is, cruciform; or winged.
Only a few representationals here.*
Faces for the first time.*

14 Years: *At this age differences between the patterns of the age groups and of adults disappear.** Use of color now more sophisticated. Combinations of black and white appear fairly frequently, and, very occasionally, white only is used.

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* Starred items are those which do not agree with our own findings, indicating possible areas of difference between American and English products.

Table 5

SIX-YEAR-OLD PATTERNS

Classification		*Number of Subjects*		*New Haven Subjects*
Prefundamental		2		0
Fundamental		4		0
Hollow circle		2		0
Attempt at covering the tray		16		4
Representational		56		68
Houses	20		28	
Scenes	19		22	
Miscellaneous objects	10		8	
People or faces	7		10	
Designs		20		23
			(Slabs)	5

similarity in that representational productions far exceed designs, and that there are very few of the more primitive types of production.

Stewart and Leland reach the following conclusions as to the significance of some of these different patterns:

1. Within the "normal" group and after preschool age, intelligence apparently plays little part in the type of Mosaic made.
2. A prefundamental pattern made by a 6-year-old child is indicative of some type of maladjustment.
3. Children making rigid, stereotyped patterns which cover much or all of the tray show evidence of personality difficulties.
4. Children who make freer patterns which cover much or all of the tray but contain elements of good organization are apt to be adequately adjusted youngsters.
5. The subjects who made miscellaneous objects were, on the whole, the brighter, better adjusted children who seemed to have no need to project personality difficulties.
6. Designs, whether symmetric or not, if made toward the center of the tray, usually indicated the better adjusted child while those which clung to the edge seemed symptomatic of immaturity.
7. In comparing the present findings with those of English children, it continues to be evident that the American boy and girl is much more apt to be concrete, or representa-

> tional in his Mosaic and less apt to make the symmetrical design so common with the English child.

A second equally pertinent and equally valuable study by the same investigators in collaboration with Strieter, "Mosaic Patterns of Eighth Grade Children" (1957), aims

> . . . to determine the types of Mosaic patterns made by the early adolescent; to observe developmental trends; to note whether sexual differences are reflected; to study the predictive value of specific patterns (such as had been found in an earlier study with first grade children); to note any cultural differences that might be found between American and English children of this age as had been observed in a previous study.

Subjects were all eighth grade children in a Long Island public school, tested over a period of several successive years. The total sample of 125 subjects ranged in age from 11 years 3 months to 15 years, with the greatest number (70) at the 13-year level. This sample is therefore scattered over an even wider age range than is the sample for the earlier study, just described. There were 71 boys and 54 girls, with two exceptions all white, and from average income homes. The I.Q.'s ranged from under 70 to above 140, over 50 per cent falling between 100 and 119.

Patterns made by Stewart, Leland, and Strieter's group fall into the classifications given in Table 6.

Table 6

EIGHTH-GRADE SUBJECTS

	Percentage of Subjects		
Classification	*Male*	*Female*	*Total*
I. Representational			
A. Kite	0.0	0.8	0.8
B. Direct representation	37.6	29.6	67.2
II. Abstract			
A. Patterns with recurring form	16.8	11.2	28.0
1. Center	6.4	6.4	12.8
2. Edge	4.8	2.4	7.2
3. Whole tray	3.2	0.0	3.2
4. Collective patterns	2.4	1.6	4.0
B. Patterns without recurring form	2.4	1.6	4.0
1. Designed slab	0.8	0.8	1.6
2. Whole tray	1.6	0.8	2.4

Since the age range covered here is so wide, we have not attempted to compare these findings with our own.

When patterns made by this older group of subjects were compared by Stewart and Leland with those made by their 6-year-olds, the following age trends were noted:

1. A greater tendency toward abstract designs (33.3% in the older group as compared with 20% in the younger group).
2. The use of perspective with the older group.
3. Almost complete disappearance of the "kite" response.
4. Almost complete disappearance of "primary system thinking."

5. A change in the selection of type of representational pattern by the bright, adjusted youngster. In our 6-year-old group, these children were more apt to make miscellaneous objects while in our present study, "scenes" were almost entirely the production of the bright, adjusted boy or girl.

Combining these two studies of Stewart and Leland with a third study by these same investigators (1952), "American vs. English Mosaics" (described more fully on p. 39), we have assembled (see Table 7) a set of figures which compare groups of American subjects at ages 4 to 7, 6 to 7, 8 to 11, 11 to 15, and 13 to 18 years of age.

Table 7

AGE CHANGES IN PATTERN, FOUR TO EIGHTEEN YEARS

Age in Years	*4–7*	*6–7*	*8–11*	*11–15*	*13–18*
Number of Subjects	82	100	74	125	250
Type of Pattern					
Abstract (%)	1.2	20	5.4	28	50.4
Representational (%)	55.0	56	71.6	68	17.2
Incoherent (%)	16.0	—	5.4	4	12.4
Single pattern including fundamental (%)	2.4	—	1.3	—	0.03
Fundamental (%)	2.4	4	9.5	—	0.08
Prefundamental (%)	23.0	2	6.8	—	0.04

Though these groups of subjects are reported in different studies, represent in themselves a rather wide age range, and are not necessarily comparable, the figures derived show a clear-cut increase with age in abstract patterns, an increase to 11 years or so in representational patterns and then a subsequent decrease, and a gradual decrease in prefundamental patterns.

Chase reports a study based on Mosaic responses of 25 girls and 25 boys each at 6, 7, and 8 years of age (1957). Subjects were American primary-school students, unselected on the basis of socioeconomic and intellectual level. Her findings, in brief, are as follows:

1. Six-year-old subjects (a) used lines in their Mosaic products least frequently, being most prominently differentiated in making fewer forms which incorporated lines and (b) made fewer designs which included horizontal lines.
2. Seven-year-old subjects (a) made non-horizontal lines most frequently, (b) were the most frequent producers of houses, (c) most frequently made designs consisting of more than one form, these forms within the design were most frequently considered as separate entities, (d) made designs showing the least symmetry.
3. Eight-year-old subjects made designs which exhibited the most symmetry.
4. The data also suggested trends, but not significant at the 5% level of confidence: (a) scenes are made more frequently as age increases, (b) forms which are irregular, linear, square or oblong and layered are made frequently at all ages, (c) forms of whirling, cross, star, rim attached and oval or diamond shape are made infrequently by all ages.
5. For this total population, representational designs were far more frequently made than were abstract designs.

Walker's study (1957), though not primarily normative, contains good descriptions of behavior characteristic of 6-, 8-, and 10-year-olds, as follows:

SIX-YEAR-OLD PATTERNS

About ¼ of the Mosaics built are nonrepresentational designs showing no evident plan—many more than at other ages. About ¼ are nonrepresentational designs with definite patterns. Half the designs are representational—many fewer than at 8 or 10 years. There are relatively many edge, frame and corner patterns made, mostly by girls.

In many designs, especially representational ones, the Mosaic pieces are used to form lines which are much as crayonned lines would be used, to form hollow outlines or stick figures. . . . Form level of designs is generally lower than at other ages. Choice of individual shapes appears less discriminating than at other ages, as does choice of particular colors.

The great majority of representational designs are single forms, nearly all depicting man-made objects—more than half, in fact, depicting houses or other buildings. A few, more girls than boys, made scenes.

EIGHT-YEAR-OLD PATTERNS

Only ⅒ of the designs made are now unpatterned nonrepresentationals, about ⅙ are patterned nonrepresentationals, and now ¾ are representational forms, including quite a few scenes. Relatively many 8-year-olds include nature forms in their representations, fewer than at the other ages use artificial or animate figures.

The linear outlines seen in about ½ the designs of the 6-year-olds are evident in nearly a third of the 8-year-olds' designs, . . . but pieces are fitted with greater care. . . . Form level is generally higher . . . color tends to be used more deliberately, being consistent with overall form in ⅗ of the designs. Eight-year-olds' products are generally colorful, with a majority of children using five or all six colors, and with white pieces forming a smaller proportion of designs than at other ages.

Representational patterns have increased from 47% at 6 years to 72% at 8 years. Scenes increase from 7 to 22. As at every age, the majority of representational designs depict man-made forms. . . . Designs depicting elements of nature occur far more often than at other ages. Nature appears most often in scenes, mostly large scenes. . . . There is a scarcity of animate figures. . . . There are only about half as many animate figures at 8 as at 10 years. . . . Linear outline is less prominent than at 6 years [pp. 193–202].

TEN-YEAR-OLD PATTERNS

Ten-year-olds do not show the marked difference from 8-year-olds that the 8-year-olds showed from the sixes. . . . Perhaps the main difference lies in greater simplicity of the 10-year-olds' designs, shown in their use of fewer pieces, fewer different colors, more white in their designs. . . . The structure of designs is more varied than at previous ages, only a third of those with definite pattern being formed by the linear methods typical of the 6-year-olds, and almost none by the filled-in outlines used by a number of 8-year-olds. A solidly fitted core of pieces, sometimes with other pieces loosely attached, seems to be one frequent construction form. Squares are often used in these central forms, especially by boys. Scalenes, again used more frequently are now more competently handled.

Color-form inconsistency appears in only 30% of design, full color patterns occur about as often as at 8 years, and designs built in a single color occur more often than previously.

The distribution of major classes of designs is very similar to the distribution at 8 years. Just 4 fewer 10-year-olds make representational designs, one more makes a patterned nonrepresentational design, 3 more make unpatterned nonrepresentational. . . . The majority of unpatterned designs are now classified as slabs. . . . Among representational designs, the number of scenes is less than half that at 8 years. The forms depicted again include a relatively large proportion of artificial objects alone—74% of representational designs, compared with 66% at 8 years—with miscellaneous small objects especially increasing in frequency. The proportion of natural forms has decreased from 23% to 6%, and the number of animate figures has increased from 11 to 20% [pp. 202–208].

MATERIALS, ADMINISTRATION, RECORDING

A considerable literature, amply reviewed both by Dörken (1952, 1956) and by Walker (1957), covers such aspects of the Mosaic as test materials, administration, recording of the test, and variations thereof. Outstanding among these references are reports by Kerr (1939), Lowenfeld (1949, 1952, 1954), Wertham and Golden (1941), Zucker (1950), Diamond and Schmale (1944), Reiman (1950), Himmelweit and Eysenck (1945), McCulloch (1949), and others.

The present volume describes materials, administration, and recording as they have been more or less standardized at and since the First American Mosaic Conference in Washington in 1950. We shall not present here a historical or bibliographic review of these topics.

RELIABILITY AND VALIDITY

RELIABILITY

Literature on both the reliability and the validity of the Mosaic test is relatively scant. Lowenfeld believes that the patterns made from time to time by the same individual will vary in specific details, such as the exact pieces used, but will retain the fundamental interrelationships among formal aspects of the pattern. Changes which do occur, she believes, represent actual changes in the individual's personality.

Walker (1957) has summarized the scanty literature on reliability as follows:

> A number of quite varied indices show test consistency ranging from only moderate to quite high. Moran and Gorman have shown that good agreement can be obtained by independent raters of certain aspects of the Mosaic pattern. The highest inter-judge agreements are for relatively objective, countable aspects of the designs, though the subjects' consistency in such aspects is not high (Himmelweit and Eysenck, 1945). It is in more subtle, abstract, patterning relationships that Lowenfeld seeks true individual consistency, even though these are less reliably assessed by different judges.
>
> Authors working with widely differing groups report that distinctive, personal aspects of the Mosaic pattern of a particular subject remain essentially unchanged from test to test, and that designs pathognomonic of clinical entities persist in many subjects, even after drastic treatment measures and apparent overt behavior changes.

The Mosaic test was included in a large battery of tests administered by Reiman to 30 mentally retarded girls, 6 to 24 years of age, before and after 7 months of glutamic acid therapy. The mean I.Q. increased significantly from 69 to 76. Reiman reports:

> . . . very little change is found and the only reliable improvements are an increase in representational productions and in symmetry of form and color. When the two designs of each girl were analyzed side by side, four showed both gains and losses in the second of the pair; five were exactly the same; nine actually showed some regression and twelve were better. It can be inferred that what modification has taken place is in the direction of greater freedom of functioning, but the major conclusion must be that the Mosaic test is much less susceptible to therapeutic agents than are other mental measurements [1950, p. 611].

Walker's own findings as to reliability are based on a group of 300 children—50 boys and 50 girls each at 6, 8, and 10 years—selected as representative of the United States urban population on the basis of paternal occupation. The Mosaic test was individually administered twice in immediate succession to each subject. Two sets of measures were made for each design: 15 "count scores" (reaction time, number of pieces, percentage of squares, etc.) and 4 classifications and ratings (design compactness, color-form relationship, goodness of form, representational-nonrepresentational status). These were found generally to have satisfactory scorer reliability.

The subjects' consistency in the use of particular count scores, when their two products were compared, ranged from negligible to substantial. Their consistency was significant for all the classification and rating variables. Blind matching, by three judges, of groups of the first and second products was successful far beyond chance expectation (Walker, 1957).

VALIDITY

Studies on the validity of the test also are somewhat limited in number. This is partly because many of the leading users of the test believe that "ordinary statistical methods are of little value for estimation of the validity of this type of clinical test where personality is viewed as a whole" (Kerr, 1939, p. 233). Lowenfeld herself feels that the counting of such simple design characteristics as number of pieces is not only valueless but that "any quantitative assessment . . . is irrelevant" (1954, p. 549).

A few studies of validity have been undertaken, however, with slightly positive results, particularly that of Walker which we have summarized below. The reader is also referred to Walker (1957) for a more detailed report on these studies. Outstanding among them are reports by Diamond and Schmale (1944), Shotwell and Lawrence (1951), Reiman (1950), Himmelweit and Eysenck (1945), and Kerr (1939). In brief, Walker's summarization of these studies is as follows (1957, p. 28):

> Though only a small number of specific item-count indices of Mosaic performance have been compared for contrasting clinical groups, occasional differences between means occur. Even when mean differences are significant, however, considerable overlap between the groups apparently exists on all such tabulations. At more abstract levels, yet with fairly precisely described criteria, Diamond and Schmale demonstrated some success in separating schizophrenics not only from normals but from other clinical groups.

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> Matching studies have consistently shown beyond-chance success in pairing personality sketches and Mosaic designs. From such studies, however, it is not possible to determine which aspects of the Mosaic patterns and which portions of the personality sketches actually contributed to validity.

This conclusion agrees in the main with that of Dörken, who notes (1952, p. 290):

> Experiments wherein mosaic test patterns were matched with character sketches (Kerr, 1939, Himmelweit & Eysenck 1945), offer evidence of the test's validity in the nature of high coefficients of contingency. While the matching of character sketches with mosaic designs by an "expert" reached a level of better than chance, the number of correct matchings given by psychiatrists and psychologists without previous experience with the test was not significantly above chance (Himmelweit & Eysenck, 1945). It was noted, however, that particularly when concrete designs were constructed the matchings were determined principally by the content of the mosaic rather than by form or use of color.

In a later review of the literature (1956, p. 164), Dörken also notes that "It seems reasonable to state that the validity of the Mosaic 'diagnostic' signs has certainly not been properly established. And there are but a few examples of careful studies to this end to date."

A validation study by Levin, using white males between the ages of 21 and 59, attempted to differentiate, on the basis of Mosaic productions, between institutional and noninstitutional groups, between normals and all other subjects, between "maladjusted" and normal subjects, and among six diagnostic groups. The results of the study were "sweepingly negative," and the author concludes that there is "no justification for continuing to use the Lowenfeld Mosaic test in its present form." It should be noted, however, that this investigator attempts to determine maladjustment by the presence of certain "signs" of maladjustment rather than by making an over-all evaluation. Most serious users of the Mosaic at this time do not rely on any such list of signs.

Rioch (1954) also, working with 100 psychiatric patients, all of above-average socioeconomic level and of average or above-average intelligence, finds the Mosaic test of "dubious value as an instrument of diagnosis."

CLASSIFICATION

A great deal of the literature to date, particularly a good deal of Lowenfeld's own writing, has to do with classification. Differences in the systems of classification described depend, in part, on the writer's notion of the purpose of the test. Thus Lowenfeld, with her emphasis on the test as a method for personality description, presents a basic classification somewhat different from that of Wertham, who sees it primarily as a tool for clinical diagnosis.

Walker gives an excellent summary of outstanding systems of classification, and we quote from his summary (1957):

Lowenfeld is most interested in a multidimensional use of her test. Many aspects of pattern structure are evaluated to provide a description of the subject, which may involve ability, personality, and organizational traits. In dealing with a "neurotic" pattern she is concerned more with describing the character of the particular neurotic individual than with assigning a diagnostic label. Her use of the test is most idiographic in exploring a *subject's primary* system: a "region of the mind which so far has not been observed, described and understood because it is inexpressible in language." This timeless and spaceless psychic sphere develops in infancy and earliest childhood through the prelogical clustering of images and events, and in later life coexists, unverbalized, with the *secondary system,* which is "reasonable, practical, governed by causality and shared with other people and to a large extent describable in language." It is because the primary system is by its nature idiosyncratic and uncommunicable to others (not because "repressed," but because inaccessible in secondary system terms) that much of Lowenfeld's work has been directed to developing methods of enabling children and adults to "talk, as it were, without the use of language." In the Mosaic Test she sees a medium for reflecting the primary system's patterns of clustering and the energy which charges them.

Wertham rejects the multidimensional, descriptive approach. He states that the test, unlike such techniques as the Rorschach, does not give a picture of the dynamic structure of personality, more or less independent of diagnostic labels. Instead, he relates each individual Mosaic pattern class to a single, formal, clinical-reaction type (schizophrenic, paranoid, organic, etc.). This approach, he feels, is more limited than is Lowenfeld's but also more valid. Other investigators tend to take intermediate positions. Often, as does Lowenfeld, they investigate Mosaic patterns made by patients in clinical groupings as a means of approach to descriptive formulations of personality structure.

The type of classification system used thus follows from the author's approach to the test. Wertham, seeing a direct relationship between Mosaic pattern and diagnostic category, can speak directly of normal Mosaic designs, schizophrenic designs, subcortical patterns, and the like. Lowenfeld, more test oriented, describes aspects of the designs themselves: a compact, abstract pattern for example. However, in her most recent classification (1954), she first groups designs as "normal" or "neurotic" patterns, then describes subclasses under these headings in terms of characteristics of the designs themselves.

Starting originally with a division of patterns into three groups: abstract, representational, and incoherent, Lowenfeld has developed a system of classes and subclasses into which all Mosaic patterns may be sorted. Within some of the subclasses additional dimensions of classification are used, but these do not cut across the entire classification system.

An outline of a recently published classification of Lowenfeld's (1954) is summarized by Walker (1957). (See Table 8.)

The items used by other investigators are mostly covered in the above lists. Himmelweit and Eysenck (1945), for example, use the abstract-concrete and compact-scattered dimensions, as well as recording the mean percentage of each color used in the designs of their diagnostic groups. Reiman (1950) determines the frequency of occurrence of a number of Lowenfeld's categories among her clinical group; and Colm (1948), in a more informal, descriptive manner, notes a large number of specific characteristics of the Mosaic patterns of disturbed children.

Diamond and Schmale (1944), in a somewhat different approach, organize their classification around a single concept—the extent of achievement of a recognizable Gestalt in the Mosaic design. They describe four levels of pattern-

Table 8

CLASSIFICATION OF MOSAIC DESIGNS

(After Lowenfeld, 1954)*

I. Patterns Made by Non-neurotic Individuals

- A. Classification according to shape and arrangement
  - 1. Abstract
    - a. Compact
    - b. Spaced
    - c. Intermediate
  - 2. Representational or concrete
  - 3. Conceptual (e.g. "spirit cleaving matter")
- B. Classification according to color of pieces
  - 1. Disregard of color
  - 2. Only one color or two contrasting colors
  - 3. Colors make an otherwise banal pattern "good"
  - 4. Form of design depends equally on shapes and colors
  - 5. Color highly original and artistic in relation to shape

II. Patterns Made by Neurotic Individuals

- A. Incoherent and compact
  - 1. Wholly incoherent
  - 2. Containing islands of design
  - 3. "Slabs" with geometric fit but no total design
- B. Incoherent and spaced
  - 1. Random placement of pieces
  - 2. Islands of pattern scattered about tray
  - 3. Islands merging, to approach category IIA2
- C. Unsuccessful designs: similar to those of class IA but with elements missing or distorted
- D. Small patterns: two or three patterns, not unsuccessful individually but not integrated into a larger pattern
- E. Intermediate
  - 1. Corner and edge
    - a. Few pieces on edge or in corner
    - b. Strip of pieces along edge
    - c. Strip extending all around edge
    - d. Pattern extending toward center
    - e. Pattern extends to merge into IIA2 or IIB3
  - 2. Frame and item
  - 3. Hollow center
- F. Representational
  - 1. Unrecognizable product which satisfies subject
  - 2. Recognizable but grotesque
  - 3. Queer choice of content
  - 4. Unsuccessful representation
- G. Use of color (e.g. particular uses of red and black)

This listing is actually a mixture of separate descriptive classes, ratings, and diagnostic criteria. Most subclasses relate primarily to design structure, but several other dimensions are intermixed irregularly: compact-spaced, type of color usage, level of success, degree of complexity. Most classes appear to be mutually exclusive, but some are not.

Other investigators, rather than trying to develop a comprehensive set of pigeonholes,

Table 8 (Continued)

have used a checklist approach, in which a Mosaic is checked on each dimension for presence of strength or type of use. Wertham (1950), for example, lists characteristics to consider before making a diagnostic interpretation:

> 1. Number of designs; 2. Coherence or incoherence of design; 3. Representational or abstract; 4. Harmony of the design as a whole; 5. Completeness or incompleteness of design; 6. Meaningfulness or emptiness of design; 7. Simple or complex design; 8. Compactness or looseness of design; 9. Distinctness of configuration; 10. Relation of design to object; 11. "Static" or "dynamic" concept; 12. Expression of configuration; 13. Position within frame of tray, distribution of pieces; 14. Number of pieces used; 15. Choice of color; 16. Choice of shape; 17. Emphasis on form or on color; 18. Simple geometric designs; 19. Appropriate choice of shapes for intended representation; 20. "Stone-bound" designs; 21. "All-over" patterns; 22. Symmetry; 23. Repetition; 24. Content; 25. Relation of design to verbal utterances of the subject.

---

* From Walker (1957).

ing: normal Mosaics, and mildly, moderately, and severely defective Mosaics, as well as an unclassified category.

OBJECTIVE SCORING

The outstanding contribution in this realm has been made by Wideman in his "Development and Initial Validation of an Objective Scoring Method for the Lowenfeld Mosaic Test" (1955).

As Wideman points out, "Clinicians using the Mosaic Test are for the most part enthusiastic. They claim empirical validity for the test *yet the proof is lacking*." Not only this, but "Lowenfeld, Wertham, and Diamond and Schmale concur in the judgment that *no exact numerical procedure is of value*." However, as Pascal (1952) has pointed out, one of the greatest problems in arriving at an objective scoring method for the test is this very attitude in the minds of some users that quantification would not contribute to the usefulness of the test.

Wideman's study was undertaken "in the belief that further knowledge of the Mosaic Test's potentiality for clinical diagnosis and personality research can only be obtained by the utilization of quantitative methods."

From the literature and from clinical experience with the test, Wideman developed 39 scoring categories for the Mosaic test, and, where possible, gave these categories operational definition. The test was administered to 107 normals, 70 schizophrenics, 48 neurotics, and 20 organic subjects. The scores of the patient groups were compared with those of the normal subjects. Studies of scoring and retest consistency were also undertaken.

> Of the 39 test categories, 32 showed significant differences between the normal subjects and one or more of the patient groups. The schizophrenics showed the greatest deviation from the normal group in Mosaic Test characteristics. The organic differed nearly as much, with the neurotics showing fewer differences. Age, sex, intelligence and education were found to have only a slight influence on Mosaic Test performance. Consistency of test

scoring was satisfactory. Retest consistency for the test categories ranged from low to high, with some of the inconsistent categories showing significant validity. It was concluded that quantitative procedures may be employed with the Mosaic Test and that the scoring categories utilized have considerable diagnostic validity.

In brief outline, the scoring scheme worked out by Wideman is as given in Table 9. Readers who are especially interested in objective scoring are referred directly to Wideman's study (1955).

Table 9

WIDEMAN'S SCORING CATEGORIES

(After Wideman)

Color:
- Percentage area
  - Percentage of each individual color
- Number of colors
- Percentage of chromatic colors
- Color pairs
- Color symmetry
  - Perfect symmetry
  - Near perfect
  - Attempted symmetry
  - No symmetry
- Color patterning
  - Present
  - Absent
- Color separation
- Color combinations

Shapes:
- Percentage area
  - Percentage for each individual shape
- Regularity index
- Number of shapes

Aesthetic Quality:
- Little or none
- Moderately pleasing
- Above average
- Superior

Design Location on Tray:
- Horizontal location
- Vertical location
- Margins
- Time

Characteristics of the Total Design:
- Total number of pieces
- Total area
- Multiple designs
- Tray area occupied
- Compactness
  - A compact design has a high index; a scattered design a low index
- Concrete-abstract
- Projections
- Completeness of design
  - Complete
  - Slightly defective
  - Markedly defective
  - No discernible pattern
- Complexity
  - Very simple
  - Relatively simple
  - Fairly complex
  - Very complex

Wideman points out the difficulty of arriving at objective scoring categories for the test:

> On the one hand clinicians insist that data from a projective test must be viewed as a total pattern. On the other hand, the test cannot be scored unless certain aspects of the data are abstracted and subjected to quantitative treatment. . . . As a partial solution to the dilemma, the position was taken that while no single quantitative Mosaic Test variable would be a valid indication of a personality trait in one individual, significant group differences would appear which would have clinical meaning. By utilizing several of these significant scores as signs, individual subjects might be validly diagnosed. . . . In the selection of categories, two principles were kept in mind, the first was objectivity, the second that of choosing categories which appeared to have clinical meaning. In several instances

> these principles appeared to be incompatible. It was not possible to retain only rigorously objective categories. Certain of these depend on the judgment of the observer. In these cases an attempt was made to give them operational definition. . . . The scoring categories (finally selected) range from those which are completely numerical and simple through an intermediate range to a few with a relatively high degree of subjectivity and complexity [Wideman, 1955, p. 178].

Actually, although Lowenfeld has expressed herself as not being interested in arriving at an objective scoring method for this test, the above-described scoring system, though more condensed, more objective, and probably more effectively useful in differentiating normal from schizophrenic, neurotic, or organic subjects, is not completely different in concept from the record form first published by her in 1951.

It is our impression that Lowenfeld may be opposed not so much to the idea of objective evaluation of test results, as to the breaking down of the response into subcategories which will obliterate the characteristics of the total response. Also, she clearly opposes a mere numerical evaluation of aspects of the response as opposed to a subjective evaluation and interpretation. In our opinion, if an objective scoring system is carefully arrived at and judiciously applied, it can be as useful—in fact, as essential—as an objective scoring of the Rorschach test, and no more than in the case of the Rorschach need it take the place of a subjective evaluation by the clinician.

INTELLIGENCE AS MEASURED BY THE L.M.T.

According to Dörken (1956, p. 166) "the relation of Mosaic test performance to measured intelligence is under considerable debate. While scattered relationships are reported by some authors, they are not generally agreed upon."

Probably the most clear-cut usefulness of the Mosaic, in designating intelligence, that has thus far been demonstrated is its effectiveness in distinguishing defective from normal subjects. Even here, according to McCulloch and Girdner (1949), "it was difficult to list even a few characteristics typical of defectives only," and the possibility is raised that it is the developmental level and not intelligence per se which is being measured.

A general relation between increasing mental age (M.A.) and the complexity of pattern and excellence of design among mental defectives was demonstrated by McCulloch and Girdner:

> One of the most notable characteristics of Mosaics made by defective subjects is their simplicity. This may be primarily a function of developmental level, and may show up in a representative sample of normal children with mental ages comparable to those of the defective group. However, it was less commonly observed with the normal group tested here than was the case with the defectives of comparable mental ages. The mosaics of the normals often had a number of components, such as parts of a scene organized into a meaningful whole. The defectives of the same developmental level more often made unitary

> figures. The well-organized mosaics of these defectives typically comprised a relatively few shapes (two or three) and a small number of pieces. The mosaics which contained more shapes and pieces were usually poorly organized. The mosaics of the normals, on the other hand, more frequently exhibited good organization when containing more shapes and pieces.
>
> Another rather striking difference between the mosaics of the normal group and those of defectives of the same level is concerned with color arrangement. The mosaics of both groups typically contained many colors (about half of the mosaics of each group contained all six), although in several instances they contained few colors or even only one. The mosaics of defectives having many colors were relatively inferior in respect to what may be called color harmony. Numerous colors sometimes appeared with fairly good effect in symmetrical placement in geometrical designs, but did not often occur in harmonious arrangement in other types of designs. The mosaics of the normal children, on the other hand, showed much better color harmony. The occurrence of blocks or continuous rows of a color, as a balanced portion of the whole mosaic was common in the mosaics of normals, but rare in the mosaics of defectives.
>
> As a check upon the apparent relationship between mental age and over all goodness of mosaics, an attempt was made by one of the authors to sort mosaics into mental age groups and a correlation was obtained between this sorting and mental age. The only data considered were the Mosaic record and the title when one was assigned. Mosaics of 88 subjects with a mental age range from 5–0 to 12–9, chronological age range from 8 to 50, were sorted. A product moment correlation coefficient of .43 was obtained between the estimates and mental age on the 1937 Stanford-Binet. This score has a statistical reliability above the one per cent level of confidence. This result is taken as confirmatory evidence of an association between mental age and some distinguishable aspects of the mosaics [McCulloch and Girdner, 1949, p. 491].

Wertham (1950) claims that:

> . . . as a rule, designs made by mental defectives show not a disorganization, but a good organization at a low organizational level. These patients usually make a number of very small, simple, compact and completed designs. Each design is made up of pieces of only one shape (fundamental design). The color scheme is often enumerative, with one piece of each available color.

Dörken (1952) notes that among mental defectives there is frequent recurrence of the same pattern, though those on the lowest intelligence levels cannot achieve even these elementary patterns, but make incoherent, scattered, and fragmentary mosaics. He also notes that concrete patterns are frequent at all ages among defectives, though the titles they assign to their mosaics usually bear no apparent resemblance to the products.

Reiman (1950) reports that although the elaborate designs of mental defectives are not well organized, her group did not construct simple designs more frequently than might be expected of other types of subjects. She concluded that mentally defective subjects could be reliably distinguished from the rest only in regard to their nonrepresentational content and lack of success. In a study of mental defectives by Shotwell and Lawrence (1951), coherence and accuracy were shown to be related to M.A.

Dörken (1952, p. 293) points out that some of the disparity in findings may well be due to the type of mental defectives examined. He notes:

Shotwell and Lawrence clearly describe the differences between the mosaic designs of brain injured mentally defective children in contrast to those of the "familial" or primary mental defectives, particularly those between the mental ages of 4–11 and 8–5. Such designs were absent in their brain injured cases, these mental defectives characteristically constructing disorganized, incoherent designs of relatively greater complexity. Thus they conclude that the brain injured defective is more liable to extend himself beyond his capacity and to become involved in "catastrophe" situations, in keeping with the concept of Goldstein.

An excellent treatment of "the use of the L.M.T. in the study of subnormal intelligence" is Lowenfeld's chapter by that name (1954). We note here merely her comments about color in the patterns of defective subjects:

> If a color is omitted, it is usually black or white, or if not black, then blue. We have seen no example of a pattern in one color. Three colors are commonly found, used in a balanced symmetrical manner and adding point to the pattern. When more than three colors are used, the disposition becomes indiscriminate.
>
> What is interesting about all patterns so far collected by us from sub-normal individuals is the absence of patterns related to the edge of the tray. . . . As to representational designs, we have no example of a genuinely successful representational design. . . . though in certain designs, when what was intended is known, it can be recognized.

Dörken points out:

> Wertham (1950) considers that the test provides a measure of functional intelligence and this is corroborated, at least for children (Wrong, 1950). It was suggested (Woolf and Gerson, 1953) that the Mosaic would probably correlate more closely with a performance test of intelligence, and fairly strong evidence was found of a positive relationship for children and mental defectives between the revised Binet MA and MA estimates based on Mosaic designs. However, no correlation between Mosaic content and the Cornell-Cox could be demonstrated (Flum, 1954) and likewise, estimates of developmental level from the Mosaics of children showed insignificant correlation with the Goodenough DAP MA scores (Reiman, 1950). Some authors consider that at levels of mental ability higher than an MA of 8 years, no relationship will be observed between psychometric test results and success on the mosaic (Diamond and Schmale, 1944; Reiman, 1950; Stewart and Leland, 1955) and therefore caution against the use of adult standards below this mental age.
>
> No correlation of Mosaic content to Wechsler-Bellevue IQ could be shown among adolescents (Flum, 1954) and aesthetic score and number of tiles employed did not correlate with intelligence in adults (Eysenck, 1947). Others report more positive results.
>
> Whether the Mosaic test is a valid measure of functional intelligence in adults has not actually been established. Certainly it possesses but minimal relation to standard intelligence test scores.
>
> Among children, though, there is scattered but fairly reasonable evidence that performance on the Mosaic test bears a relationship to intelligence. Inasmuch as changes in performance related to age are also evident, it would appear that the test has some sensitivity to intelligence during the period of major growth and development (i.e., until the CA of 14 to 16 approximately) but after that is of little use in this regard.

With our own subjects, though children of lower intelligence, in general, made simpler, less elaborate, and less "successful" patterns than did those of higher intelligence, usually the Mosaic seemed to reveal more clearly the developmental level rather than the level of intelligence.

SEX DIFFERENCES

Though we ourselves have found sex differences in Mosaic products to be conspicuous and striking, there is relatively little in the literature on this aspect of individual differences.

Dörken, in his 1952 review, notes that Stewart and Leland (1952) "find a tendency for boys to make concrete designs more frequently than do girls, but these and other sex differences become less at adolescence."

Dörken later comments more fully (1956, p. 168) as follows: "Little in the way of sex differences has been reported, and these are apparently attributable to the differing rate of maturation between the sexes in childhood." Diamond and Schmale (1944) state that no sex differences are evident in the test performances of adults, Wideman (1953) reports "almost negligible" differences (more adult women did not use black, more frequently used a large proportion of white), and Kerr (1939) notes a lessening of sex differences at adolescence. A greater incidence of abstract and scattered designs among girls was the only obtained sex difference in one study (Reiman, 1950). This, however, corroborated the earlier findings of Kerr (1939). In other words, boys more frequently made concrete and compact designs. Possible sex differences in the deaf have also been studied (Gelbmann, 1952). As LaLonde (1954) concluded, "The attempt to delineate between masculinity and femininity with the Mosaic test through the study of 20 characteristics observed in 100 protocols proved to be rather unsuccessful. None of the items studied were found to be important in differentiating the sexes. . . ."

Stewart and Leland (1952) found a tendency for boys to make concrete designs more frequently than do girls, but they noted that these and other sex differences become less at adolescence. In their 1957 study (p. 77) they give a summary of sex differences which they found in eighth grade American children, as follows:

1. Flowers are represented by girls proportionately ten times as often as by boys.
2. A proportionately greater number of girls depicted "human beings," and only the female sex constructed "children."
3. Airplanes are the dominant masculine choice.
4. Houses by themselves are made proportionately by three times as many boys as girls; other buildings by a slightly larger percentage of boys; but houses *as parts of scenes,* only by girls.
5. Abstract designs are depicted equally by both sexes but with the following difference: almost twice as many boys as girls made edge patterns while a slightly higher proportion of girls made centered patterns.

Walker's observations on 6-, 8-, and 10-year-old subjects (1957), summarized briefly, are: "Boys made more representational designs than did girls, who made more abstract patterns. Also boys were more concerned with fitting together of pieces: they made more compact designs, chose more of the shapes which fit together easily."

DIAGNOSIS

ORGANIC DISEASES OF THE BRAIN

An increasing body of literature is growing up concerning the diagnostic possibilities and usefulness of the Mosaic test, though the complications and difficulties inherent in making such diagnoses are many. Wertham (1950) considers that the "diagnostic correlation does not cover the whole range of classifiable mental disorders. It is very clear in schizophrenia or in mental deficiency, less clear in the varieties of psychoneuroses."

Wertham (1937, 1950) and Wertham and Golden (1941) offer extensive data on organic brain disease and consider that it is possible to distinguish two kinds of lesion by means of the Mosaic test. Wertham describes a "cortical pattern" wherein these patients express their cortical defect in an inability to achieve a good configuration; there is a dismemberment and dissolution of the Gestalt.

> Patients with dementia use very few pieces . . . represent very simple elementary geometric forms such as a circle or a star. They are likely to use shapes inappropriate for their goal and they tend to use color indiscriminately. . . . Sometimes subjects with diffuse cortical brain disease make a number of very small incomplete designs. In the most advanced conditions of dementia, patients merely place a few scattered pieces on the board.

In contrast to remissions in schizophrenia, cases of remission in a condition such as dementia paralytica are said to reflect their improvement in the Mosaic test, being able to achieve better configurations. The "subcortical pattern," according to Wertham, is characterized by "stonebound" designs. "At the expense of an inner plan the patient follows the impetus inherent in the shape and color of the pieces put down so that the whole response becomes reduced to a more mechanical or automatic level."

One of the most clear-cut reports on the diagnostic value of the Mosaic test in cases of brain injury in children is that of Colm. She notes that

> . . . projections in designs which indicate organic brain damage are: simple additive placement, side by side; additive placement, using one color only; lining up tiles of the same shape or same color or both; piling up similar tiles on the tray; repeating a primitive design in shape and color. All brain damaged children are overdependent on immediate external stimuli, and have difficulty in formulating and carrying through a plan for a design. But the degree of their dependence on outside stimuli differs according to whether they work in a stimulus bound fashion merely by adding similar tiles, or whether they can only line up or pile up similar piles. Their dependency on stimuli and lack of planful thinking has different degrees according to their dependency on one, two, or three factors—size, shape, color.
>
> In the designs there are as many possibilities of showing the characteristic brain injury changes as there are brain injured children. Yet all projections somehow show in different degrees the three "organic factors" mentioned before: bondage to stimuli, loss in ability to shift, and repetitiveness, all of which are different aspects of the child's impairment in generalized thinking [1948, pp. 229, 230].

Ellenberger (in Lowenfeld, 1954) agrees with Wertham that the L.M.T. is an excellent and valuable instrument for use in the differential diagnosis of diseases of the brain from mental diseases. He notes the following characteristics of patterns made by patients suffering from organic diseases of the brain:

> Patients with organic brain disease often do not respond to the test. . . . If they do respond at all, they will in general carry it out without interest, as if it were a school task or a burdensome moral obligation. . . . They become irritated by the difficulties of the test; and after having completed their response are often left with a sense of failure or dissatisfaction. . . . The essential characteristic of their response is the great difficulty, often the impossibility, which they find in realising the *gestalt* which they have in mind. Patients frequently attempt to circumvent this by choosing a very simple form composed of four or five pieces with which success can be achieved, after having failed with a slightly more complicated form.

Ellenberger also agrees with Wertham that in all the cases of brain disease in which the cerebral cortex has been affected (whatever the specific nature of the difficulty), the same group of characteristics are found in response to the test. Differential diagnosis by the L.M.T. among these conditions is not possible. It can supply information about the stage and severity of the condition, rather than information about its nature (Lowenfeld, 1954, pp. 240, 241).

MENTAL DISEASES

Ellenberger (Lowenfeld, 1954, p. 248) also presents most succinctly additional information regarding mosaic patterns to be found in subjects "suffering from different kinds of mental diseases."

> **Depressive states.** In contrast to organic cerebral conditions, a characteristic pattern for patients suffering from depressive states does not appear. We have found a certain number of individual characteristics of the responses of such patients which frequently appear but are not constant, and none of these specifically characterises a depressive state. Moreover the characteristics shown in L.M.T. responses are the same whatever the cause of the depression.
>
> The characteristics which are most commonly found in responses made by patients suffering from depression are as follows:
>
> a) The patients show little desire to do the test. Often they will refuse but this obstacle can often be overcome.
>
> b) The patient performs the test slowly without displaying any interest in what he is doing.
>
> c) One frequently finds a preponderant use of black or perhaps blue.
>
> d) Certain designs appear to be fairly typical of depressives: such are lines sloping down from the left to right; frames with the points turned to the inside; a falling arrow or similar image; the presence of a vertical wall, symbolizing imprisonment.

Depression is said to be more evident by retardation and feebleness of production than by choice of dark colors (Diamond and Schmale, 1955). Patients suffering from a severe depression usually cannot be induced to make designs (Wertham, 1950). The criterion of black and blue as characteristic of subdued and depressive moods is considered by Wertham (1941, 1950) as valid only when colors are also included in the pattern (black or black and white being a more typically schizoid feature.) McLeod, however, considers that these patients invariably start with red, off-center, and tend to make small droplet patterns. With improvement, he finds that red and white combinations are brought in and that the droplet pattern becomes less evident.

Manic states. As in the study of states of depression, we have found in the study of manic states no constant characteristics. In mania and manic conditions also a certain number of frequent but not invariable characteristics appear, none of which is by itself pathognomonic. The general characteristics of the response of such patients to the L.M.T. are as follows:

These patients generally show great eagerness to do the test. They execute their response fairly quickly, though with care and with obvious pleasure. Often they chatter without pause during the whole test. When it is over, they tend to display great satisfaction and to enjoy being complimented upon what they have done. . . . The responses of manic patients are generally very colorful with a certain preference for red, though actually black is seldom absent [Lowenfeld, 1954, p. 252].

In manic states, the emphasis of the design is on color rather than on form (Wertham and Golden, 1951; Wertham, 1950); typical are massed and jutting red forms. The designs are usually relatively simple and hypomanics are said to construct carelessly organized and dispersed patterns (Diamond and Schmale, 1955).

Manic-depressive psychosis. Responses here are individual but patterns made during the manic phase often represent the expansiveness of this phase in contrast to patterns made during the depressive phase which reflect the patient's feelings of uselessness, worthlessness and hopelessness [Lowenfeld, 1954, p. 254].

Schizophrenia. Ellenberger points out that "in the pseudo-dementia of schizophrenia, we are dealing with a regression to previous stages of development. This is why it is possible to a large extent to compare the responses of advanced schizophrenics with those of very small children, a thing which is not possible in cases of organic deterioration" [Lowenfeld, 1954, p. 258]. He then indicates the type of Mosaic made by schizophrenic subjects in four stages of regression. He notes first, however, that the findings of Wertham and Golden to the effect that the designs made by schizophrenics are usually abstract, or if concrete, unrealistic and vague; that color is unrealistically used and often disregarded or used indiscriminately; that emphasis is more on form than on color or even in advanced and deteriorated cases scattered incoherent jumbles are produced, are often true *but are by no means pathognomonic or even typical.*

Sometimes schizophrenics, especially hebephrenics, show an astonishing disinterest in symmetry. The use of color is often excellent, especially by paranoids. . . . Therefore it seems not warranted to use the L.M.T. as a means of differential diagnosis, especially not as a "blind diagnosis," but rather for the further investigation of a patient whose diagnosis is already known.

The four stages of schizophrenia and the accompanying Mosaic products which he describes are as follows:

Fourth Degree. We are here concerned with the most regressed cases of schizophrenia, those of a vegetative way of life. . . . There is a striking resemblance between the way in which these patients respond to the L.M.T. and that of infants of 16 to 18 months. Frequently the patient cannot take the pieces out of the box and it is necessary to show them to him and to leave them close at hand. The patient looks at the pieces with interest, plays with them, puts them in his mouth, drops them, and sometimes though more rarely, he may by chance move the pieces on the tray, but always haphazardly.

Third Degree. These are cases of schizophrenia which are somewhat less regressed. . . . They are not "Sucklings" but "Little children," capable of getting up, walking about, eating unaided, and even of occupying themselves, in however fitful and momentary a way. . . . With regard to the L.M.T. the difference between these patients and the preceding group lies in the spatial distribution of the pieces they use. These patients can play with the pieces, but when they place them on the tray they arrange them so that each piece stands by itself,

> and they place the pieces deliberately. Apart from this, they make no choice of colors and no attempt at organization or construction of figures.
>
> *Second Degree.* The essential difference between these patients and those of the preceding group, is that patients of the Third and Fourth degrees no longer belong to the schizophrenic world; they have escaped from their illness and taken refuge in the return to infancy . . . or that of the small infant, where they live in a state of euphoria and are free from delusional ideas. . . . Patients of the second degree still live in the world of psychosis. They suffer from delusions and hallucinations. . . . This schizophrenic world is a dissociated world. These patients live, as it were, in fragments. . . . In regard to their response to the L.M.T., their essential characteristic is fragmentary organization. The pieces are no longer placed singly in the tray, but more or less in groups, not pushed at random one against another but placed to a certain extent in relation to each other. This fragmentary organization can take several forms. The most frequent are: a) a series of pieces placed two by two across the tray; b) chains of similar pieces going across the tray; c) groups of fragments.
>
> *First Degree.* The essential difference between these patients and the former groups is their coherence. Patients of the first degree belong to the world of language, and it is possible to hold a connected conversation with them. Their delusions are coherent and ordered. . . . In their response to the L.M.T. these patients are able to create an organized pattern in the general sense of the word. . . . As Wertham well says, there is "an emphasis on form rather than on color." The total effect is often discordant and unpleasing [Lowenfeld, 1954, pp. 258–264].

In summary, Ellenberger (Lowenfeld, 1954, p. 277) comments:

> The study of the correlations between the L.M.T. and particular forms of schizophrenia is only in its infancy, but it seems to be full of promise. . . . Responses of patients to the L.M.T. should give useful indications as to which patients would be more accessible to group therapy, to art therapy, to individual psychotherapy, to occupational therapy.

Other outstanding studies on the mosaic patterns of schizophrenic subjects, as summarized by Dörken (1952), are those of Wertham and Diamond and Schmale.

Wertham (1950) considers that the Mosaic test clearly reveals a fundamental psychological aspect of the schizophrenic process. There is a typical splitting of psychic functions seen in the dissociation between content and form . . . "two tendencies that should form a unity are no longer properly integrated. . . . The formal tendency that is expressed . . . in super-symmetry gains the ascendency and emancipates itself from the whole sense or content of the design. Super-symmetry is considered as an almost pathognomonic sign of schizophrenia." Repetition and stereotopy may also be found. Thus, schizophrenic designs are usually abstract and not representational. When these patients attempt to make a concrete object it is apt to be unrealistic or excessively schematized. Sometimes color is disregarded, frequently with only one being utilized, or else only used as a formal element to achieve a rigid symmetry. Wertham (1941 and 1950) also discussed a paraphrenic group and states that in such cases the Mosaic test may conclusively indicate the presence of a psychosis by the appearance of "simple agglutination. . . ." Simple agglutinations are "as pathognomonic for severe chronic functional psychoses as the Wassermann test is for syphilis."

Diamond and Schmale (1944) also report the active color rejection or disregard, in preference to form, as characteristic of the schizophrenic. Additional features they note are: abnormal condensations, third dimension literality, bizarre choice of subject and a tendency to construct unrelated patterns. Considering the tray as a "field of force" McLeod states that schizophrenics invariably begin by defining the border, possibly in an attempt to delimit the boundaries of the reality situation which for them is vague and uncertain. This border design is said to be characteristically repetitive, the "bordering" lessening with recovery. When "fully" recovered, their designs display an obsessive symmetry.

PSYCHOPATHS

According to Ellenberger (Lowenfeld, 1954, p. 280), "Our knowledge and experience of the L.M.T. with psychopaths is still very limited. On this subject, all, or nearly all, is still to be done."

NEUROTICS

Some authorities consider that "there is no such thing as a typically 'neurotic mosaic' " (Dörken, 1952). Diamond and Schmale (1944), for instance, find that the patterns of neurotics are often within the limits of normality.

Lowenfeld, however, devotes an entire chapter of her 1954 book to the use of the L.M.T. in the study of neurosis. Since this is by far the most comprehensive treatment of the subject available, we shall quote from it rather fully. Her discussion deals with neurotic patterns in European subjects. According to her, the chief characteristics of a neurotic pattern are as follows:

1. Misinterpretation of instructions and such questions as, "Must I fill the whole tray?"
2. Disturbance of the normal relation to the pieces. The subject attempts to make a pattern with the pieces, but they get out of hand.
3. The commission of errors of which the subject is unaware, in the completing of the design.

> This type of disturbance is the opposite of #2, in that in #2 the subject spoils his own design through a compulsive need to go on adding pieces after he has lost grip of the situation he originally devised. In #3 the subject thinks he has achieved a finished pattern of design that expresses whatever he set out to do and is satisfied with his attempt. In reality, however, he has made errors in its presentation which he has failed to perceive [pp. 208–218].

Lowenfeld then lists abstract patterns whose form is associated with neurosis:

> 1. Patterns with a relation to the edge of the tray: In all collections of Mosaic responses so far made in any culture the opinion of the workers responsible for their collection is unanimous that there is a definite and practically unvarying connection between certain forms of patterns and the presence of neurosis in the subjects who made them. These patterns are in the main those that have a definite relation to the edge of the tray such as Frame, Edge, Corner, etc.
> 2. Patterns with a relation to the whole area of the tray:
>   a. Scattered or incoherent
>   b. Disordered
> 3. Specialized forms of centralized patterns:
>   a. Winged—a pattern in three parts, two of which are mirror images of each other. In individuals who make such patterns, . . . an inner danger remains that the personality will fail to stand up to a situation that is experienced as sudden or prolonged strain. . . . These patterns appear in normal children with the stresses of adolescence but with successful solution of these stresses they may later disappear.

> b. Cruciform . . . made by individuals in whom two major drives are at variance with each other and therefore produce a complete standstill [pp. 218–224].

Intrinsic neurotic qualities in representational designs include:

1. Designs in which the content is neurotic, as, for instance, dealing with elimination
2. Lack of cohesion
3. Incomprehensibility
4. Distortion

Intrinsic neurotic qualities in abstract patterns include:

1. Very small, simple patterns
2. Small complex patterns not placed centrally in the tray
3. Successful patterns with individual neurotic features

> There is no royal road to the understanding of neurosis as reflected in the L.M.T. any more than in any other clinical instrument, . . . It is the general balance of features in the pattern that are important, and only considerable experience both in the use of the L.M.T. in clinical work and of the processes of psychotherapy themselves can bring about a satisfactory understanding of the patterns made by patients. One variety is, however, easily perceived and significant in meaning: The pattern with a hollow center—its significance compares with the feelings of inner emptiness of the Rorschach test and indicates a personality in which a central core is lacking [pp. 224–228].

According to Lowenfeld:

> It is in the use of color that neurotic forces come, at times, most clearly to expression:
>
> *Black:* It is not necessary for black to be associated with neurosis . . . but when a number of black pieces form the center of a slab, or incoherent pattern, these are indicative of a serious degree of depression.
>
> *Black and white:* According to the context in which a design occurs the exclusive use of black and white can either be expressive of aesthetic values or of retreat from emotional experience or expression.
>
> *Red:* As with black, it is only in conversation with the subject that it can be ascertained whether the color has been used because it is pleasing to him and appears to him to have a cheerful connotation or whether it expresses anger or destructiveness.
>
> *White:* White when it is used in European responses has usually the significance of negation. . . . If it appears in the center of the pattern it has much the same significance as a hollow center; if on the outside of a pattern it indicates a certain neutrality, or inhibition, or awkwardness in social relations.
>
> *Yellow:* Patterns wholly carried out in yellow have not been met with, but very rarely a neurotic significance is given to the colour through association in the mind of the subject between it and pus or urine. Apart from this type of association, no intrinsic connection has been observed between the use of yellow and the appearance of neurotic traits.

Stewart, Leland, and Strieter (1957), in their study of eighth grade American subjects ranging in age from 11 to 15 years, considered the neurotic versus the normal pattern and attempted to predict future adjustment from the Mosaic pattern. Among the conclusions reached on this point are the following:

> In order to predict future adjustment from the Mosaic pattern, more than one design from a given subject is necessary. However, among our 14 maladjusted youngsters the following features may be noted: 1 "kite" pattern; 2 age-inadequate representationals; 1 bizarre; 1 dysphoric; 2 ugly and unsuccessful; 2 highly sexual; 2 slabs. Of the remainder, 1 was mediocre in quality while 2 were well executed and seemingly "normal."
>
> Our slab patterns were constructed only by maladjusted youngsters which is in accord with Dr. Lowenfeld's experience although not with some of our own previous findings. However, it must be remembered that our sampling of this type is extremely small.
>
> Changes in the pattern during its production must also be noted since the final emergent design seems frequently to be an expression of deeper, unconscious motivation. For example, several of our children began with rather banal, conventional patterns but changed to others which seemed more indicative of what we knew to be at the time areas of conflict.

A suggestive listing of some of the outstanding characteristics of Mosaic patterns of normal, schizophrenic, neurotic, and organic subjects is given in Table 10, which is adapted from Wideman's excellent study (1955).

Table 10

CHARACTERISTICS OF NORMAL, SCHIZOPHRENIC, NEUROTIC, AND ORGANIC SUBJECTS
(Adapted from Wideman, 1955)

Normals:
- Use more pieces than do others.
- Use four or more colors.
- Avoid the use of white.
- Abstract designs usually show symmetry of form and color.
- Use more shapes than the abnormal, usually four or more.

Schizophrenics:
- Use less red, green, blue, and yellow.
- Use a lot of white, in combination with one other color, thus black and white, yellow and white, green and white, or black and yellow.
- Use less than four different colors.
- Use fewer pieces than do normals, and fewer different shapes.
- Make multiple designs, such as several small abstract designs.
- May make a whole design or much of one in a solid color.
- Use squares and other simple pieces more than do normals.
- Symmetry is not good.
- Make missilelike or religious symbols.
- Black and white, or yellow and black, used in an abstract design, are almost pathognomonic of schizophrenia.
- Make slabs of 15 or fewer pieces.

Neurotics:
- Higher percentage of red and less blue and green.
- Fewer and simpler shapes than in normals and schizophrenics.
- May make more than one design.
- Simple designs. Make simple geometric shapes.
- Take a longer time.

Organics:
- Somewhat restricted use of color.
- Use few colors and less color patterning.

Table 10 (Continued)

Small, simple compact designs. Do not make scattered designs.
Fail in symmetry.
Unpleasing design.
(Schizophrenics, in contrast, use fewer chromatic colors, more pieces, make more scattered, more complex, and more complete designs.)
Little use of oblong pieces.

CULTURAL DIFFERENCES

Lowenfeld places considerable emphasis on the differences between American and English Mosaics. Our first awareness of these differences came from a personal communication from her, dated Feb. 28, 1952. In this letter she discusses differences which she has observed between typical products of English children and those made by a presumably normal group of American school children, collected by Dr. Gertrude Reiman.

Lowenfeld summarizes these differences as follows:

> 1. A large number of designs occur, in the American patterns, in which the pieces are grouped together in a way that is "compact" in that the pieces all stick to each other—but in which no recognizable "pattern" emerges.
>
> 2. The absence of certain patterns that are standard in Europe and almost invariably turn up in children's mosaics, for example, elaboration of fundamental patterns, particularly designs based upon the 8-pointed star of diamond shapes, and so on.
>
> 3. The occurrence of a large number of designs (such as "edge" and "corner") that occur with us mainly or wholly with disturbed children.
>
> On the other hand, when the American patterns have form, they have great positive value and interest and are really different from what is made by European children.
>
> Now I know that you have very different views from ours as to the stage of development children reach at different ages, so my first question is how this sort of collection (i.e., some very good patterns and then a large number of "edge," "shapeless" ones, and very small patterns) compares with your 12-year-olds? Is it possible that the children who now make shapeless patterns will later produce organized ones?
>
> On the other hand is it possible that there is a great difference in the general habits and education of American and European children respectively in their Kindergarten and lower grades in regard to pattern making? For example in Kindergarten and Nursery Schools over here, all children make "patterns": everyone is interested in "patterns" and children enjoy doing them. Any normal European child would therefore be conscious of some measure of failure if it handed in formless "patterns" of the kind referred to above—but apparently the American child feels differently. If this is so, what is the base?
>
> The significance of the problem lies in the fact that, since it is normal for European children to make a "pattern," the fact that a child does not do so is an important factor in estimating its intelligence and character structure. If, however, not making a pattern is normal for the American child, how are we to discover the distinction between the neurotic and the normal child in America?

It is in this "pattern without recurring form," which she considers so common in American Mosaic products and so absent in the European, that Lowenfeld continues to find the main difference between European and American patterns.

A second outstanding difference, according to her, is that Americans make predominantly representational, Europeans predominantly symmetric, accurate, patterned, abstract designs.

These and other differences are presented in detail in her chapter, "The Use of the L.M.T. in the Study of Cultural Problems" (Lowenfeld, 1954, pp. 282–314). For those particularly interested in cultural differences in this test, reference is made to this comprehensive discussion. Briefly, Lowenfeld calls special attention to the so-called "slab" patterns; that is, patterns

> . . . made up of a collection of pieces used either geometrically or non-geometrically or in a combination of both, arranged without a formal outer *gestalt*. Such patterns when they occur in English collections always represent a *failure* on the part of the subject either to achieve a desired *gestalt* or to conceive of a *gestalt* at all. That is to say, their appearance is associated either with immaturity or with disturbance of the subject. The American-type slab, on the other hand, often represents to the subject who makes it a pleasing and satisfactory achievement, fully integrated with his conception of the qualities that generally go to form a pattern. [This difference represents, as Lowenfeld sees it] . . . a difference not so much of the appearance of the finished structure, as of attitude and aim in relation to the whole reaction to the test.

Americans appear, Lowenfeld explains, to bring an entirely new approach to the test in that they seem to have a concept of the shape and color of individual pieces as having a dynamic relation to each other:

> In the European attitude to the pieces, each piece used by the subject plays its part in the *total* structure of the pattern; it is a part of a whole; whereas in the American designed slab, the tendency is for each piece to be felt as an entity expressing a particular relationship *to its immediate neighbour* and not necessarily having a relation to the pattern as a whole. Furthermore, the geometric relations of the pieces are to the European the essential fact about them, whereas to the American subject who makes a designed slab, the geometric relations between pieces are simply aspects of the pieces which he can use or not as he pleases in the construction of his design. Repetition either of single pieces or of groups of pieces in relation to other pieces is to a European an essential element of design, but to the maker of a designed slab, repetition either of single pieces or of combinations of pieces is totally unimportant.

Until products from relatively comparable populations are available for study, however, any such comparisons appear to be based chiefly on clinical judgment. It seems probable that conspicuous differences may exist, but just what they are has not as yet been clearly demonstrated.

One of the most specific comparisons of cultural differences has been made by Stewart and Leland in their brief paper, "American versus English Mosaics" (1952). In this paper these writers report a comparison of 250 Mosaic patterns made by American high-school children of ages 13 to 18 years (a rather wide range) as compared with a *similar* group of English children. The following contrasts were found:

> Of our 250 patterns we have fifty-nine (23.6%) symmetrical in form and color. We have thirty-eight (15.2%) symmetrical in form but not color. We have twenty-nine (11.6%) attempted symmetrical patterns but with errors which make them unsuccessful. *This totals*

> *one hundred twenty-six (50.4%) of abstract patterns. The English totals in the same age group with which we are comparing these is 90%.* The English successful abstract is 82.6% as against our patterns which were successful symmetrically in form and color of 23.6%.
>
> The next large difference apparent is in the proportion of representational patterns made. Our children made forty-three (17.2%) representational patterns. The English children made 7.05% of these.

Considering more immature patterns—prefundamentals, single fundamentals, several fundamentals and small patterns including fundamentals, or small patterns not including fundamentals, there were in all 50. Of these, only 15 were made by children of low I.Q. There were no such patterns in the English sample.

> Our last large classification also shows striking difference from the English standard. This class is called incoherency by Lowenfeld as she says "Pieces are grouped on the tray at random showing no coherent idea or order." Of such, we have thirty-one (12.4%) as against 2.8% of the English. . . . Every one of these incoherent and artistically poor patterns are made by children who do not show troubled and neurotic lives.
>
> [In summary] Our children make a strikingly smaller proportion of abstract symmetrical, balanced, conventional patterns and when our children do make this type of pattern, it is much more apt to show a color or piece variant which breaks its symmetrical perfection. From the earliest age our children make a much higher percentage of representational patterns. The third striking difference is that our children make a large percentage of patterns showing no coherent order. This is the type which has been considered in England to indicate mental or emotional disturbance. The significance with our children seems to be entirely different. Many of our most stable children make this pattern.

Table 11 gives figures for Stewart and Leland's high-school group as well as for two other age groups showing specific comparison at two different age ranges (though there is no indication that the English and American subjects are correctly matched except for age).

Table 11

Comparison of English and American Products

(Adapted from Stewart and Leland)

	4–7 Years		*8–11 Years*		*13–18 Years*	
	English	*American*	*English*	*American*	*English*	*American*
	128	82	147	74	250	250
Abstract (%)	40.2	1.2	80.7	5.4	90.0	50.4
Representational (%)	19.7	55.0	9.0	71.6	7.05	17.2
Incoherent (%)	44.0*	16.0	10.3	5.4	2.8	12.4
Single pattern, including fundamental (%)	—	2.4	—	1.3	—	5.0
Fundamental (%)	—	2.4	—	9.5	—	8.0
Prefundamental (%)	—	23.0	—	6.8	—	4.0

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* Total slightly exceeds 100%.

INDIVIDUALITY

It seems to be relatively well established that, in the hands of the experienced clinician, the Mosaic test is useful in the diagnosing of brain injury, schizophrenia, the neurotic individuality, and possibly other serious disturbances. Furthermore, in our opinion it also gives clear-cut evidence, in the first years of life, as to developmental level and as to intelligence.

In addition to these uses, it can, in skilled hands, provide considerable information about the individuality of normal subjects. Literature on this aspect of the use of the test is somewhat limited and most difficult to summarize. As with the Rorschach, there is no simple list of "signs" which can be applied objectively. Arriving at a comprehensive personality evaluation based on a subject's Mosaic design requires, perhaps, no less skill, intuition, and experience than the drawing up of an effective psychogram based on his responses to the Rorschach cards.

In fact, according to Lowenfeld (1954, p. 152),

> It is often said by workers who begin to use the L.M.T. that the process of acquiring experience in its use resembles that of acquiring a new language. There is truth in this remark. Carrying out a response to the L.M.T. is, in a sense, the use of certain flexible instruments to express something of importance to the creator; and while each individual expression has qualities that make it unique within a certain range, yet there is a grammar which is used by all; and to understand what is expressed, this grammar must be learned and must indeed become second nature in the tester. When this has come about a mosaic can be read almost as immediately as any other statement in comparable media, and, to the definite knowledge of the tester gained through the analysis of the total response, intuition can add overtones of knowledge that it is difficult to express in words, much as overtones of this nature appear in any good interview.

The best reference for those workers attempting to learn this "grammar" is Lowenfeld's chapter, "The Use of the L.M.T. in the Study of Normal Personality" (1954, pp. 149–207). Any serious student of the Mosaic will need to become thoroughly familiar with this chapter itself, so we shall merely summarize it very briefly.

According to Lowenfeld (1954, p. 151),

> In interpreting responses to the test there are six aspects to be considered: (a) the manipulation of the material; (b) the relation between the pieces used and the space of the tray; (c) the form of the resulting design; (d) the handling of colour; (e) the content; (f) the comments of the subject and his attitude to the test and to what he has made.
>
> These six aspects can again be analyzed according to: (1) the intrinsic structure of the design as constructed by the subject: (2) the relation of the subject to his design when completed; (3) the comparative study of collections of designs made by subjects showing similar major personal characteristics such as age, sex, culture, social background, level of social adaptation; (4) comparative study of designs qua designs.
>
> It is possible for features that have been shown to occur characteristically in neurotics to appear in the design of an individual who is achieving an outward appearance of normality. . . . Mosaic designs can therefore indicate a stable as contrasted with an unstable personality.

Lowenfeld (1954, pp. 196–198) summarizes the main aspects of personality that can be deduced from careful analysis of the responses to the L.M.T. of a normal individual as follows:

1) The general integration of the personality
2) Presence or absence of anxiety
3) General level of intelligence and of constructive ability

4) Degree of originality or of conventionality
5) Presence or absence in the personality of such definite qualities as accuracy, sense of order and balance, ability to plan and to carry out a project spontaneously conceived, speed of thinking
6) Artistic interests and abilities
7) Ingenuity and dexterity in manipulation
8) Accuracy in perception of external reality
9) Possession of a sense of humor
10) Presence or absence of obsessional traits
11) Energy or its lack
12) General strength or weakness of the personality
13) Outgoing tendency in the personality
14) Ability to accept limitations and to make the most of what is available

Probably the most objective approach that has been made to the study of individuality in normal child subjects, as evidenced by Mosaic patterns, is that of Walker (1957). His subjects consisted of four paired samples, with 24 8-year-olds and 24 10-year-olds in each. Selected by peer nominations, teacher nominations, and a drawing task, and matched on age, sex, and I.Q., the pairs represented opposite extremes of four personality dimensions: stability, surgency, overt aggressiveness, and creativity. The Mosaic designs of the contrasted groups were first compared on count scores, classifications, and ratings. Each paired sample showed significant differences in four to seven of these predetermined variables.

Then global descriptions of qualities which seemed, on inspection, to contrast most sharply the designs of each group were composed. The validity of the descriptions was evaluated on a separate sample. Three judges who were unfamiliar with the Mosaic test were given the designs of a normative sample of 8- and 10-year-olds (whose personality was unknown to the experimenter), along with the global descriptions. The judges selected designs resembling the descriptions, and the children who made these were then tested on a variety of measures to determine the accuracy of predictions.

One or more of these validating measures showed significant differences between the judges' choices for stable and unstable, surgent and desurgent, and aggressive and unaggressive children. None appeared between their choices for creative and uncreative children. It was concluded that associations do exist between children's Mosaic designs and their personality traits.

Table 12, modified from Walker (1957), indicates the chief Mosaic indications of stability, surgency, aggressiveness, creativity, and their opposites.

Throughout the literature there is a good deal of unsystematized reference to type of content as well as type of design as related to personality factors. Thus Colm (1948, pp. 223–229) suggests:

> We find in the literature on the Mosaic test a description of designs made by children with a prevailing practical intelligence: children who make animals, airplanes, warships, guns, people, ships, houses. While these designs reflect the child's more or less differentiated practical intelligence, they may also show emotional struggles he goes through in the process of growing up. For example, children who are preoccupied with growing away from the mother toward greater independence and who at the same time hesitate to leave the mother,

Table 12

Chief Mosaic Indications of Various Individuality Characteristics
(Adapted from Walker)

Stable and Unstable:*	
Stable:	*Unstable:*
Big colorful scene Many squares More representational Human figure (except faces only) Solid blocklike structures Pieces fit in a simple, compact fashion Scenes Houses, especially made of squares	Covering up all paper Few scenes here Scattered and diffuse, or spaced, or center and periphery Abstracts Faces Touching only at points Highly complex or *tricky* fit Overlapping Little houses (square + triangle)
Surgent and Desurgent:	
Abstract Surgent:	*Abstract Desurgent:*
Central and pieces radiating out Boldness and freedom of concept and execution	Most abstracts fall here Central piece held in—contained by others Outside coming in Frame, with or without central core Heavy corners Total fill-in or nearly so
Representational Surgent:	*Representational Desurgent:*
May radiate Pleasant scenes Abandoned use of color (thus lots of blue = sky, etc.), as in modern art Dog, clown, etc. Extends beyond paper Houses, except 2-piece houses	Few, but too-simple things might be desurgent, as a too simple box, etc.
Nonaggressive and Aggressive:	
Nonaggressive:	*Aggressive:*
Harmless subject matter Flowers, trees, etc. Many small, unrelated patterns Clings to edge Scenes, human and animal figures, houses	Sharp-pointed pieces—projections Small and white Heavy massing (circular, jutting) Massed black, especially if core or base line Pendant from top Black and/or red Inanimate movement, especially of a striking, thrusting, or whirling quality
Creative and Noncreative:	
Creative:	*Noncreative:*
As would be expected—creative Often scenes Agreeable Animals, usually Large, and good relationship of parts Movement and activity Most representationals	Slabs (might be either) Little output, impersonal and impoverished Faces Meaningless products

---

* All the plusses do not go together necessarily, in any one child. Thus a child could be unstable-creative.

often use the symbol of a ship. Designs of houses are made repeatedly by children who come from foster homes, institutions, or from homes where there is much tension. Craving greater security as they do, they think obsessively of houses, sometimes quite elaborate ones. Often these houses are fenced in and isolated when the child tends to withdraw or is kept away from human contact.

Children who make animals as designs in the Mosaic Test often project their hostile feelings about their fathers, mothers, siblings or themselves. Designs of people also reveal the child's conflicts. There are designs of people without heads, or with comparatively little head, which are frequently made by children with learning difficulties. Airplanes, warships, guns and other openly aggressive designs indicate the child's emotional "growing up" struggle. . . . If the emotional balance of a child with practical intelligence is seriously disturbed, the practical patterns which he makes become unbalanced.

[As for abstract designs] There are two basic dynamic patterns of abstract designs. There is the "drifting" abstract design without noticeable configuration; and the genuine abstract design in which a child follows calmly and securely a well thought out plan. The design of abstract appearance which shows that a child is merely "drifting" along in a task is in most cases a sign of evasiveness, of lack of spontaneity, and of inability to work out constructively a well planned design. . . . His work with the Mosaic tiles makes it clear that the underlying and projected attitude of this child is passive, suggestible, and without the quality of spontaneous self-expression. . . . These children like to do what they are told; they feel safest in copying others.

In the genuine abstract design the child follows calmly and securely a well formulated plan, and must be in good control of his emotions in order to be able to use the right tiles for his plan. . . .

There are several types of abstract projections which reflect different kinds of solutions for the child who struggles with his aggressiveness. Children who are so insecure that they are preoccupied largely with fighting as a means of defense often make designs which consist of nothing but the sharp, aggressive tiles, such as the diamond or wedge shapes. . . . The colors which they choose, mostly red and yellow, fit into this same aggressive category. . . . Children who are forced by their life experience to deny their healthy aggression and who can neither accept nor express their aggressive feelings, show a compulsive need, each time they use a tile in an aggressive way, to cover up the aggressive point at once.

[However] Children with over-aggressive behavior do not necessarily make an aggressive type of design. . . . They may use open space as part of their design by leaving out tiles. Children with mainly oppositional drive as their defense . . . use empty space as their design. . . . Anxious, withdrawing children . . . use open spaces in the patterns simply as a factor rather than as a central theme.

Children whose school functioning is inadequate in spite of good learning capacity make designs which reflect their personality constriction and their anxiety at the same time. . . . They make a fence-like pattern or a frame for their design or around the design. . . . Or this same type of constricting influence at home may be expressed by the exact and carefully executed stripe pattern which some children make, and recognize as a flag only after they have made it. Frequently over-controlled, over-conforming, stammering children make this stripe design.

The child who in spite of good emotional and intellectual endowment cannot carry through his original design because of the presence of conflicting emotional drives often makes a design which begins in a perfectly balanced way and which gradually becomes vague and unbalanced.

Part Two

CLASSIFICATION

CHAPTER 4

Type of Structure

In classifying products according to structure, we have departed somewhat from Lowenfeld's major system of classifying and have followed more closely that of Walker (1957). Lowenfeld's major division of products divides them into representational and conceptual (abstract) designs.

Instead of the term conceptual (abstract) design, we have used, as does Walker, the general classification *nonrepresentational designs,* and have divided this group further into designs *without pattern* and those *with pattern.* These two groups are subdivided further as in the classificatory list below and in Table 13. Our second main class is that of *representational* designs, and this is subdivided into *objects* and *scenes.* Our system of classification is, therefore, as follows:

A. Nonrepresentational designs without pattern
  1. Just drop or pile
  2. Scatter singly
  3. Prefundamental
  4. Slab
    Small
    Large
  5. Over-all

B. Nonrepresentational designs with pattern
  1. Fundamental
  2. Central design
  3. Design along rim
  4. Fills tray
    Frame and item
    Whole pattern
  5. Separate designs

C. Representational designs
  1. Object
  2. Scene

D. Mixed, representational and nonrepresentational

For the rationale of this system of classification, reference is made to Walker (1957).

Table 13

TYPE OF STRUCTURE

	2*			3			4			5			6			7			8		
Age in Years	*G*	*B*	*All*	*G*	*B*	*All*	*G*	*B*	*All*	*G*	*B*	*All*	*G*	*B*	*All*	*G*	*B*	*All*	*G*	*B*	*All*
A. Nonrepresentational without pattern																					
1. Just drop or pile	22	16	38	7	3	10	1	2	3												
2. Scatter singly	**24**	**30**	**54**	**18**	10	**28†**	5	6	11	1	0	1	—	—	—	0	1	1			
3. Prefundamental	4	2	6	6	**12**	18	7	4	11												
4. Slab																					
Small	—	—	—	—	—	—	1	2	3	4	1	5	1	0	1	1	1	2	0	1	1
Large	—	—	—	—	—	—	—	—	—	1	3	4	1	3	4	0	1	1	5	3	8
5. Over-all	—	—	—	—	—	—	—	—	—	1	0	1	0	2	2	—	—	—	0	2	2
ALL A	50	48	98	31	25	56	14	14	28	7	4	11	2	5	7	1	3	4	5	6	11
B. Nonrepresentational with pattern																					
1. Fundamental	—	—	—	1	2	3	3	4	7	—	—	—	—	—	—	—	—	—	2	0	2
2. Central design	—	—	—	0	2	2	11	6	17	9	6	15	11	3	13	10	3	13	9	4	13
3. Design along rim	0	2	2	4	3	7	1	2	3	1	3	4	0	2	2						
4. Fills tray																					
Frame and item	—	—	—	6	1	7	0	1	1	3	0	3	1	1	2	2	4	6	5	4	9
Whole pattern	—	—	—	0	0	0	1	0	1	0	1	1	0	0	0	4	1	5	1	1	2
5. Separate designs	—	—	—	1	1	2	0	0	0	3	2	5	5	2	7	5	1	6	0	1	1
ALL B	0	2	2	12	9	21	16	13	29	16	12	28	16	8	24	21	9	30	17	10	27
C. Representational																					
1. Object	—	—	—	7	10	17	**18**	**20**	**38**	**22**	**29**	**51**	**23**	**24**	**47**	11	**18**	29	**14**	**20**	**34**
2. Scene	—	—	—	0	6	6	0	3	3	3	5	8	9	13	22	**16**	17	**33**	11	14	25
ALL C	—	—	—	7	16	23	18	23	41	25	34	59	32	37	69	27	35	62	25	34	59
D. Mixed, representational and nonrepresentational	—	—	—	—	—	—	2	0	2	2	0	2	—	—	—	1	3	4	3	0	3
Totals	50	50	100	50	50	100	50	50	100	50	50	100	50	50	100	50	50	100	50	50	100

Table 13 (Continued)

Age in Years		*9*			*10*			*11*			*12*			*13*			*14*			*15*			*16*	
	G	*B*	*All*	*G*	*B*	*All*	*G*	*B*	*All*	*G*	*B*	*All*	*G*	*B*	*All*	*G*	*B*	*All*	*G*	*B*	*All*	*G*	*B*	*All*
A. Nonrepresentational without pattern																								
1. Just drop or pile																								
2. Scatter singly																								
3. Slab																								
Small	2	2	4	0	0	0	0	0	0	0	3	3	0	0	0	0	0	0	0	0	0	0	0	0
Large	4	3	7	7	4	11	6	3	9	5	3	8	7	1	8	2	0	2	2	2	4	0	0	0
4. Over-all	1	0	1	0	1	1	1	2	3	2	0	2	1	0	1	1	1	2	1	0	1	5	0	5
ALL A	7	5	12	7	5	12	7	5	12	7	6	13	8	1	9	3	1	4	3	2	5	5	0	5
B. Nonrepresentational with pattern																								
1. Fundamental																								
2. Central design	**13**	5	18	9	5	14	9	6	14	**17**	10	27	**20**	17	37	**19**	**20**	**39**	**18**	**23**	**41**	15	**25**	**40**
3. Design along rim	3	1	4	0	0	0	0	0	0	1	2	3	0	2	2									
4. Fills tray																								
Frame and item	2	2	4	2	3‡	5																		
Whole pattern	1	3	4	3	4	7	3	4	8	4	2	6	1	1	2	2	1	3	1	1	2	1	1	2
5. Separate designs	2	0	2	3	1	4	6	2	8	3	1	4	3	0	2	3	2	5	4	2	6	2	2	4
ALL B	21	11	32	17	13	30	18	12	30	25	15	40	24	20	44	24	23	47	23	26	49	18	28	46
C. Representational																								
1. Object	11	**24**	**35**	11	**19**	**30**	**16**	**27**	**43**	11	**25**	**36**	12	**19**	**31**	13	15	28	12	15	27	10	17	27
2. Scene	10	10	20	**14**	13	27	8	6	14	7	4	11	6	10	16	10	11	21	12	6	18	**16**	5	21
ALL C	21	34	55	25	32	57	24	33	57	18	29	47	18	29	47	23	26	49	24	21	45	26	22	48
D. Mixed, representational and nonrepresentational	1	0	1	1	0	1	1	0	1	0	0	0	0	0	0	0	0	0	0	1	1	1	0	1
Totals	50	50	100	50	50	100	50	50	100	50	50	100	50	50	100	50	50	100	50	50	100	50	50	100

Boldface numbers indicate leading type or types at an age.

* Figures were doubled at 2 years, since only 50 cases were used instead of 100 as at other ages.

† Some of these are named but are here classified as nonrepresentational since they do not resemble objects.

‡ One of these is a slab, making 5 large slabs.

NONREPRESENTATIONAL DESIGNS WITHOUT PATTERN

This class includes those nonrepresentational products, or designs, which show only chance, if any, repetition of elements. The first two classifications under this, (1) *Just drop or pile pieces* and (2) *Scatter pieces singly,* are self-descriptive. The third class, *prefundamentals,* (3), occurs conspicuously alone (that is, not as part of more complex patterns) only from 2 to 4 years of age.

Prefundamentals are made up of any simple combination of 2 or 3 pieces, usually of the same type, in combinations approaching but not reaching the so-called fundamentals, which are designs with pattern described on page 51. Typical prefundamentals include 2 large triangles base to base, 2 squares side by side, 3 large triangles in a half circle, 2 small triangles placed together to form a square, 2 scalenes side by side with their bases together, 2 diamonds with their sides touching in wing formation, and 2 scalenes with their long sides together to form a rectangle. Two common prefundamentals made up of nonidentical pieces are a square capped by a small triangle, but unnamed, and a large and small triangle base to base.

Central masses or *slabs* (4) have been divided somewhat arbitrarily by size into (*a*) small slabs and (*b*) large slabs. Designs in this class, termed *slabs* by Lowenfeld and *agglutinations* by Wertham, are somewhat difficult to describe, though they are readily recognized after sorting over a large number of Mosaics. Slabs are illustrated in Plate 20. In this type of design, a number of pieces of different shape are placed one against the other to form a compact figure, in which no over-all meaningful pattern or design can be recognized. Primarily, the figure is free in the tray, that is, unattached to the rim; however, some pieces may contact the rim as the figure is enlarged, but the form did not "grow from" the rim.

The fit of pieces shows considerable variation among slabs, as is described in greater detail in the section on slabs. Some slabs seem to have been simply pushed together into a mass; in some, the pieces are placed together without attention or insight into matching lengths of adjacent sides. Some slabs contain more carefully fitting "islands of form," and in some the fit of pieces is careful and accurate throughout. In addition to large and small slabs, we classify as slabs those designs which are slabbish in pattern even though they are somewhat open and linear in dimension.

The fifth class here, *over-all formless designs* (5), includes spaced, compact, or intermediate designs covering all or a large part of the tray without any apparent leading idea. (An objective actually expressed by several children who built the compact "fill-in" design was not to create a product but to cover up as much of the white paper as possible, or to fit the pieces together "like a puzzle.") Segments of patterning appear in many of these designs, but they are not integrated into a total pattern.

NONREPRESENTATIONAL DESIGNS WITH PATTERN

First in order of increasing maturity come (1) *fundamentals* which, according to Lowenfeld (1954, p. 35), are "the simplest patterns that can be made with each piece." (That is, all pieces in the pattern are of the same shape.) Examples of patterns classed as fundamentals, with an indication of the age when each first appears in this collection, are given in Plate 19. As will be seen, the basic square made of 4 squares occurs first at 4 years of age. The circle and large triangle made of large triangles both occur first at 4 years. The square and linear figures made of small equilateral triangles also occur first at 4 years. The arrow or fishtail made of diamonds occurs first at 6 years, and the diamond and star made of diamonds are first seen at 7 years. Fundamental figures of scalenes occur first at 8 years of age.

The second class of representational forms with pattern is (2) *central designs*. We have here discussed fundamentals as a separate class of design, though actually they are the simplest type of central design. We consider central designs to be those beyond the fundamental stage—patterns which combine pieces of several different shapes, or those which combine pieces of a single shape in a manner more complex than a mere fundamental. These designs may be spaced, compact, or intermediate. They may be asymmetric, or symmetric with two corresponding halves or with four corresponding quadrants. An occasional design is found in which the symmetry is not perfect, but in which the subject shows an over-all patterned plan which is so nearly carried out, even though not completely accurate, that the product seems more fairly to be classed here than among non-patterned designs.

Next come (3) *designs along the rim of the tray*. Included here are Lowenfeld's *edge* and *corner* categories. The pattern may follow only a short distance of the rim, may form a "ribbon of pattern" along the length of the edge, or may follow the entire rim of the tray as a frame. Patterns constructed in a corner of the tray are also classified here.

Edge patterns may be only the width of a single piece or may extend some distance into the body of the tray. As the pattern enlarges beyond a certain point, it becomes an *over-all* pattern and is no longer classified here. When an edge pattern covers more than a third of the area of the tray (visually estimated), it is classified as an over-all pattern. (This arbitrary decision was reached on the basis of observation of the process of construction; the building of large edge patterns seems most closely related to the "fill-in" approach taken in the formless over-all design.)

Pattern filling the tray is classification (4). In this class are included all patterned designs which incorporate the whole area of the tray, rather than concentrating in the center or clinging to the rim. The simplest type of over-all design involves the placement of pieces in a patterned or systematic fashion over the tray surface. The design may be compact or spaced. In some designs there is a layered or "striated" appearance, from the use of pieces of different shapes or colors to fill in different sections, often caused by the maker's running out of pieces of a given kind. Some general system of placement must be followed in these over-all patterns; otherwise, they are classified as *nonrepresentational over-all formless designs.*

Within the pattern-filling-the-tray class, two rather specific types of structure appear with some frequency. One of these shows a balanced relationship which contrasts pieces placed in the center of the tray with pieces placed at the periphery. As in Lowenfeld's *frame-and-item* class, the peripheral pieces may form a compactly fitted frame around an inner design, or the peripheral elements may consist of only a few pieces spaced around the edge, or there may be complex designs built into the corners. The central pieces usually form a single balanced design, which may be spaced or compact. As with edge patterns, a few designs may show only the gross basic form of the center-and-periphery figure, with the individual forms being small, unpatterned clusters of pieces.

In the other particular method of incorporating the total area of the tray—*whole pattern*—several separate patterns are distributed over it. The designs may be similar to each other and may show a patterned relationship in their placement, or they may appear to be unrelated. Sometimes a number of fundamental figures form an over-all pattern.

Separate designs (5) consist merely of several separate patterned designs. This class differs from the category just described in that the several designs which make it up do not fill the whole tray.

REPRESENTATIONAL DESIGNS

Representational designs are divided into two main classifications—objects and scenes.

Objects are by far the most frequent form of representational design at the ages here studied. The product consists of one (or of several, as the case may be) object usually (though not necessarily) placed freely at or near the center of the tray. The design is simply "there in space," unrelated to other objects or to any surrounding medium. Forms basically different from the object are included only as more or less essential accessories to the object: a fireplace may contain a fire; a house may have a chimney and smoke. But these are apparently fundamental parts of the concept; the object is complete in itself.

When several unrelated objects are made by one child (arrow, house, box), they are classified in this same category—as objects.

We use Walker's classification for *scenes:*

> Instead of a single object, representational design may depict a complex scene containing many different objects, all related spatially and conceptually. An intermediate zone between the single object and the complex scene is entered as the "accessories" to the single object are multiplied, or as the object itself (as house) is repeated. No clear boundaries between objects and scenes appear, but somewhat arbitrary separations can be drawn.

Designs are classified as scenes when additional scope is given to the single main form by any of a variety of simple methods. One method is that of adding one or two different forms, which may be secondary to the main object but are not an essential part of it. Another is that of repeating the same form, identically or with only slight variation. These devices, simple as they are, serve to change the single object from something which is just "there on the paper" to something in a setting, something which has scope. For example, placement of a tree or trees next to a house adds scope by placing the house in the environment. Addition of a groundline or horizon or of natural forms—sun, sky, clouds—are similar means of increasing scope. Or repetition can turn a simple basic house form into a village. Similarly, a single tree form repeated can become a forest.

Less difficulty occurs in classifying complex scenes which include a number of essentially different forms in spatial and conceptual relationship. Many such scenes imply extension beyond the limits of the tray, as if intended to show that the view presented is just one fragment of a larger scene [Walker, 1957].

MIXED REPRESENTATIONAL AND NONREPRESENTATIONAL FORMS

This category is self-explanatory. Frequently, a series of *separate designs* will include one representational object, or a design which resembles a nonrepresentational center-and-periphery design may have a central figure which, instead of being a design, represents some object.

AGE TRENDS

As Table 13 indicates, *nonrepresentational designs without pattern* are the predominant type of design at 2 and 3 years of age. They continue to appear, except at 6 and 7 years, in close to 12 of our 100 at an age, at every age through 12 years. An appreciable number at 2 years "just drop or pile," but the majority "scatter pieces singly." There are few products, at 2 years, beyond this level.

At 3 years of age, the class "scatter singly" leads all other types of design, but, after this age, nonrepresentational designs without pattern do not appear conspicuously. In fact, "just drop or pile" and "scatter singly" virtually drop out after 4 years of age. Slabs, however, appear throughout, varying in number from age to age from 2 to 11. Slabs are most numerous at 10 and 12 years.

Nonrepresentational designs with pattern scarcely occur at 2 years of age. At 3 years, however, they are made by nearly one-fourth of our subjects. From 4 years through 12 years they take second place, being exceeded by representational designs. From 13 through 16 years they share first place with representational designs, sometimes exceeding and sometimes being exceeded by representational designs.

Representational designs occur for the first time at 3 years of age, and even by 4 years they very slightly exceed the others. By 5 years and from then on through 11 years, they occur almost twice as frequently as do those of the second leading type—nonrepresentational designs with pattern. From 12 through 16 years they share first place with nonrepresentational designs with pattern, sometimes exceeding and sometimes being slightly exceeded by the latter.

SEX DIFFERENCES

The most conspicuous and consistent sex difference in type of design is that, at every age except 15 and 16 years, when differences are very slight, more boys than girls make representational objects. Conversely, at every age from 3 through 14 years, more girls than boys make nonrepresentational designs with pattern.

At 15 years, however, the situation reverses itself. Now girls make very slightly more representational than nonrepresentational patterns; boys make slightly more nonrepresentational than representational patterns. At 16 years this reversal of trend is seen even more conspicuously. Girls make 26 representational as against 18 nonrepresentational designs; boys make 22 representational as against 28 nonrepresentational designs.

When we consider some of the subclasses of type of design, we note the following: Sex differences in the number of slab designs are slight and variable, though more girls than boys do make slabs, at every age except 12, from 10 through 14 years.

Single central nonrepresentational designs with pattern occur more in girls than in boys at every age from 4 through 13 years; boys exceed girls at 14 to 16 years.

Representational objects (exclusive of those appearing in scenes) occur in more boys than girls at every age. More boys than girls make scenes from 3 years through 8 years, and at 13 and 14 years. Girls make more scenes than do boys at 10 to 12 years, and at 15 and 16 years.

Thus, in general, for the first 14 years, nonrepresentational designs are made more by girls, representational patterns more by boys. This situation is reversed at 15 and 16 years of age.

CHAPTER 5

Form Level

NONREPRESENTATIONAL AND REPRESENTATIONAL

We have classified form level separately for representational and for nonrepresentational products, since the problems involved and the steps to be mastered appear to be different for each. In assigning form level we have followed quite closely the classification determined by Walker (1957).

NONREPRESENTATIONAL

Nonrepresentational designs are classified in six categories as follows. Each product is scored in only one category, the highest one in which any part of it may fall.

I. *Incoherent, formless.* Pieces are placed on the board with no apparent shape or structure in mind. The fact that the viewer might conceivably feel that two pieces were in line, or opposed, is not important here.

II. *Islands, even small islands, of form.* These are apparently intended by the child. What may be called prefundamentals (any simple combination of two pieces, usually of the same type).

III. *Intermediate: spaced-unspaced.* More than islands of form, there should be definite structured areas. If a total structure includes one reasonably good form but other quite shapeless areas, the total product is scored here.

IV. *Slabs.* A pattern in which a number of pieces are placed either closely or loosely in juxtaposition to each other, without the creation of an over-all symmetric shape. It is essentially a single pattern, though slab patterns can be repeated in the same composition.

V. *Good form.* What Lowenfeld calls "unsuccessful." That is, what the subject is trying to make is evident and he is nearly successful, but one or more pieces are wrong. (This is for form only; color is not considered here.)

VI. *Successful form,* entirely "correct."

Table 14

FORM LEVEL, NONREPRESENTATIONAL PRODUCTS, NUMBER OF SUBJECTS AT EACH LEVEL

Age in Years	*Number of Subjects*	*Girls*						*Number of Subjects*	*Boys*					
		I	*II*	*III*	*IV*	*V*	*VI*		*I*	*II*	*III*	*IV*	*V*	*VI*
2	25*	22	3	—	—	—	—	25*	23	2				
3	43	26	9	7	—	—	1	34	13	18	3			
4	30	6	10	12	1	1	—	27	7	4	7	2	6	1
5	23	1	3	9	4	5	1	16	0	0	6	4	4	2
6	18	—	—	4	2	7	5	13	1	1	3	3	4	1
7	22	—	1	6	1	7	7	12	1	0	1	1	8	1
8	22	—	—	2	5	6	9	16	—	2	1	3	7	3
9	28	—	—	5	5	8	10	16	—	—	3	4	6	3
10	24	—	—	1	8	5	10	18	—	—	1	4	6	7
11	25	—	—	1	6	8	10	17	1	0	1	2	5	8
12	32	—	1	0	6	10	15	21	—	—	1	5	3	12
13	32	—	—	1	8	10	13	21	—	1	0	2	3	15
14	27	—	—	1	3	6	17	24	—	—	1	0	6	17
15	26	—	—	2	3	4	17	28	—	—	—	2	9	17
16	23	—	1†	1	4	3	14	28	—	—	2	—	9	17

* This number has been doubled to make 50 subjects.

† An abstract.

Table 14 presents, for girls and boys separately, the classification of all nonrepresentational products according to this tabulation. These tables show how definitely the more advanced or accurate form levels predominate at the later ages.

Sex differences are somewhat variable. The largest single number of girls' products cluster at level V as early as 6 years of age, cluster equally at levels V and VI at 7 years, and at level VI at 8 years and following. The largest single number of boys' products reach level V at 6, 7, 8, and 9 years. Not until 10 years and following do the largest single number reach level VI. Thus individual girls reach level VI sooner than do individual boys.

If, however, we divide the subjects, as to form level, into two groups—those whose products rate at levels I, II, and III, and those whose products rate at levels IV, V, and VI—the picture is slightly different. Then we find that, even as early as 4 years, half as many boys are in the more mature group as in the less mature, and at 5 years and following, more boys fall in the more mature than in the less mature group. Girls' products as a group are a little less advanced. Not until 5 years do half as many girls' products fall in the more mature as in the less mature group. The majority cluster at level VI from 6 years and following. Thus, as a group, boys seem to attain good form slightly sooner than do girls.

REPRESENTATIONAL

Representational patterns are classified in four major categories as follows:

I. *Very simple form.* Very small types, and also larger designs with only a simple level of patterning. Single, small, 1- to 4-or-5-piece figures. The very simplest representational designs are apparently achieved more by accident than by plan. Also included are very simple forms that appear arbitrarily named; for example, a rectangle of squares called "boxes," or a line of pieces called "sidewalk." Special subclasses are:

- a. Pieces grouped or named, though bearing little or no resemblance to the thing named.
- b. Pieces used as paint, the resulting object resembling, at least to some extent, the thing named.
- c. Two to five pieces combined, often very aptly, to resemble the object named.

II. *Simple-popular form.* The majority of single representational forms fall into this class. Forms at this level often have an "adequate but uninspired" quality and generally lack strong individuality. Some quite simple scenes fall into this grouping. (Where large or complex forms are attempted, using pieces besides squares, especially designs having oblique sections, the design often reflects the subject's difficulty with construction.)

III. *Apt or complex form.* Individualistic treatment of a popular form, or successfully handled complexity of form.

IV. *Clever or ingenious form.* Designs at this level show originality, ingenuity, and often real artistic merit.

Table 15 indicates the extent to which representational objects made by 5- to 16-year-olds fall in each of these four categories. As will be seen, girls' products occur predominantly at level II from 5 to 7 years, at level III from 8 to 10 years. They drop back to level II at 11 years, then continue at level III from 12 to 16 years. The high points for products at level IV occur at 10, 15, and 16 years.

Boys' products cluster predominantly at level I at 5 years, level II at 6 and 7 years, level III at 8, level II at 9 and 10 years, and level III at 11 to 16 years. The products at level IV occur most at 10 and 16 years.

Thus, in general, there is an improvement in the form level of the products made by both girls and boys as they grow older.

The classification of form given here has seemed useful to us, but it seems quite possible that each clinician, as he becomes more experienced in the use of the Mosaic with child subjects, will wish to work out his own classification of form level. Thus Lowenfeld (1954) identifies three special kinds of representational design (kite, fox, and rhinoceros) made commonly by children but seldom found in the products of adults. These she defines as follows:

Kite: In moving pieces together a subject makes a new form that looks to him like something, and he names it. This process consists essentially in an association of ideas that takes place in the mind of the subject after a design is completed. An example of this is the placing of two scalene triangles with their long sides together to give the outline of a kite.

Fox: The design is made quickly and spontaneously by the child, who sets out to make exactly what it actually represents by the pieces. . . . What has occurred is a direct perception of form presented by the subject in the simplest way, the pieces being used almost as if they were painted with strokes of a brush with the least possible attention to the form or color of the pieces themselves.

Rhinoceros: The maker has set out deliberately to exploit the qualities of the individual pieces to the fullest extent so as to build up a presentation of an external object with detailed precision.

Table 15

FORM LEVEL, REPRESENTATIONAL PATTERNS, NUMBER OF SUBJECTS AT EACH LEVEL

Age in Years	*5*		*6*		*7*		*8*		*9*		*10*		*11*		*12*		*13*		*14*		*15*		*16*	
	G	*B*	*G*	*B*	*G*	*B*	*G*	*B*	*G*	*B*	*G*	*B*	*G*	*B*	*G*	*B*	*G*	*B*	*G*	*B*	*G*	*B*	*G*	*B*
Form level I	9	**18**	11	12	4	3	5	5	1	2	—	—	1	1	1	1	—	2	1	1	—	—	2	—
Form level II	**15**	12	**14**	**19**	**13**	**21**	9	13	8	**17**	7	**15**	**14**	15	3	10	7	11	6	9	7	**9**	3	5
Form level III	1	4	6	6	9	9	**11**	**14**	**9**	13	**14**	12	8	**18**	**11**	**16**	**10**	**15**	**13**	**14**	**11**	**9**	**14**	**12**
Form level IV	—	—	1	—	1	2	—	2	3	2	4	5	1	—	3	2	1	1	3	2	6	3	7	5
Totals	25	34	32	37	27	35	25	34	21	34	25	32	24	34	18	29	18	29	23	26	24	21	26	22

Lowenfeld's *kite* pattern is one which we have identified in very young children, though not certainly in this sample. It coincides with our form Ic, described above (p. 57). Many of our simplest forms, such as the 2-piece "house," may actually be kite patterns.

The *fox* type of design is a common one in American child subjects, coinciding with out Ib above (p. 57). It occurs most commonly around 5 years of age. (See Plate 5.)

The *rhinoceros* type of design seems to us to fall under Class IV above—"clever or ingenious form." As Table 15 shows, it occurs in our present population as early as 6 to 7 years of age and is strong at 10, 12, and 14 to 16 years. Examples will be found in Plate 32.

ACTUAL SHAPES USED

Though casual observation does not always reveal the fact, careful counting of the different-shaped pieces that are used at the different ages reveals very clear-cut age trends as to the shapes used predominantly. Figures 1 and 2 and Tables 16 and 17 present the average of the percentages of each shape used at each age.

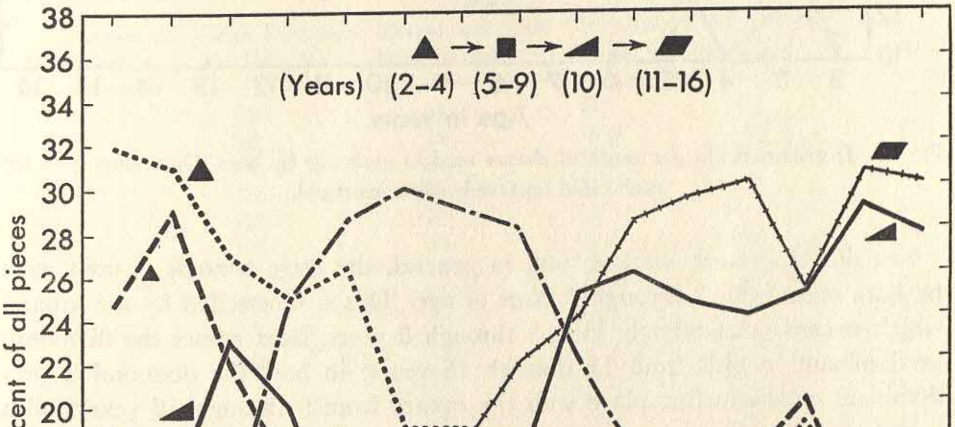

Fig. 1. Distribution (in per cent) of shapes used at each age by girls. Data computed for each child separately, then averaged.

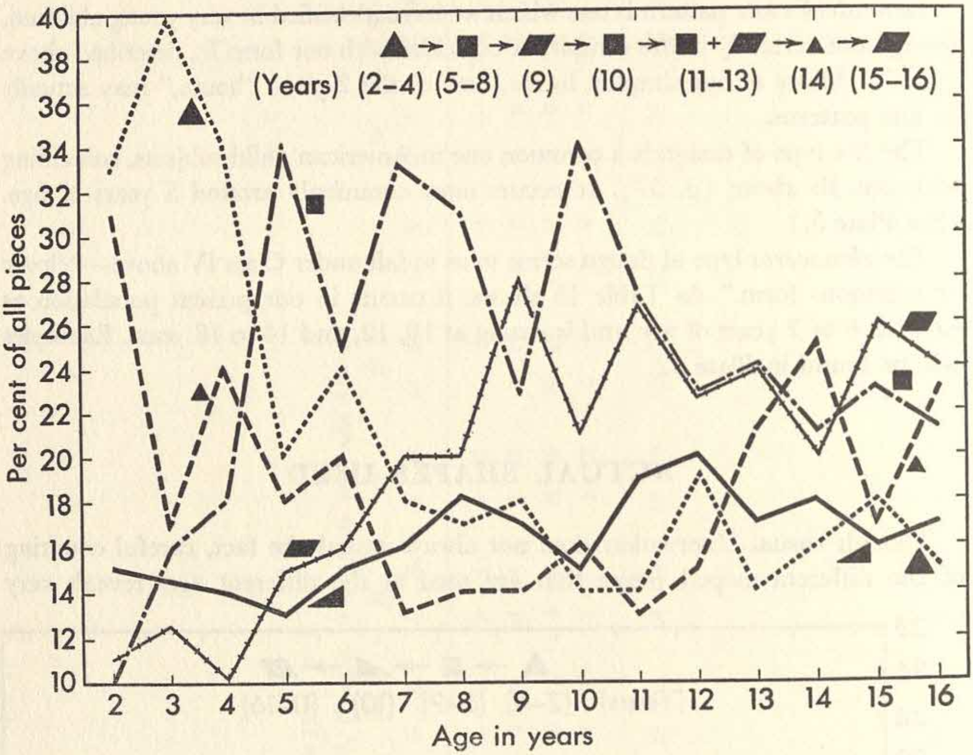

FIG. 2. Distribution (in per cent) of shapes used at each age by boys. Data computed for each child separately, then averaged.

Sex differences are marked, but, in general, the large triangle is used most by both sexes from 2 through 4 years of age. This is superseded by the square, which is used outstandingly from 5 through 8 years. Next comes the diamond, predominant in girls from 11 through 16 years; in boys the diamond is predominant or shares first place with the square from 9 through 16 years (with minor exceptions).

In spite of this rough, over-all similarity, there are, as with most factors, conspicuous sex differences. These show up most clearly in Figures 1 and 2, where it will be seen that the outstanding shapes at succeeding ages predominate more clearly in girls than in boys. Thus in girls, after 10 years of age, diamonds clearly predominate, with scalenes a close second and other shapes being used only minimally. In boys, on the other hand, though squares and diamonds quite clearly lead at most ages from 7 years on, from 12 years on all shapes are used more evenly.

Specifically by shapes, the following trends appear.

LARGE TRIANGLE

The range in percentages used from one age to another is greater in boys, but the average used (all ages combined) is close, 21 per cent in boys, 20 per

Table 16

EXTENT TO WHICH DIFFERENT SHAPES ARE USED (AVERAGE OF PERCENTAGES), GIRLS

Age in Years	*Large Triangle*	*Small Triangle*	*Scalene*	*Diamond*	*Square*
2	32	24.5	16	8.5	19
3	31	29	16	9	15
4	27	22	23	13	15
5	25	17	20	13	25
6	26.3	15	13.3	17	28.3
7	19	17	16	18	30
8	19	18	16	18	29
9	18	15	17	22	28
10	15	15	25	24	22
11	14.5	13.5	26	28.5	17.5
12	16	13.5	24.5	29.5	16.5
13	15	17	24	30	14
14	19	20	25	25	11
15	15	14	29	30.5	11.5
16	14	17.3	28	30	11
Average	20	17	21	21	19

Table 17

EXTENT TO WHICH DIFFERENT SHAPES ARE USED (AVERAGE OF PERCENTAGES), BOYS

Age in Years	*Large Triangle*	*Small Triangle*	*Scalene*	*Diamond*	*Square*
2	33	31	15	11	10
3	40	17	14.5	12.5	16
4	34	24	14	10	18
5	20	18	13	15	34
6	24	20	15	16	25
7	18	13	16	20	33
8	17	14	18	20	31
9	18	14	17	28	23
10	14	16	15	21	34
11	14	13	19	27	27
12	19	15	20	23	23
13	14	21	17	24	24
14	16	25	18	20	21
15	18	17	16	26	23
16	15	23	17	24	21
Average	21	19	16	20	24

cent in girls, and the large triangle predominates, in both from 2 to 4 years. In girls, large triangles share first place with squares at 5 years, but in boys, by 5 years, squares have already taken over. The large triangle is not used conspicuously after 6 in either boys or girls.

SMALL TRIANGLE

The range in this form is slightly greater in boys than in girls, and it is used a little more, on the average, by boys than by girls (17 per cent in girls; 19 per cent in boys). It is used most by girls at 2 and 3 years, by boys at 2 and 4, and never again occurs conspicuously except at 14 in girls and at 14 and 16 in boys. Small triangles actually predominate over all other shapes in boys at 14.

SCALENE

The range in the use of this shape is much greater in girls than in boys, and it is used much more, on the average, by girls than by boys (21 per cent by girls; 16 per cent by boys). Also, as Figure 1 shows, the scalene, conspicuous at 4 to 5 years, is the predominant form used by girls at 10 years of age, and it is used conspicuously by girls thereafter. At no age is it used conspicuously by boys, though in boys, as in girls, there is some increase with age.

DIAMOND

Here again, the differences are fairly marked, although the same general pattern is followed by both sexes. The range is greater in girls than in boys, and the average of percentages is greater in girls for the total age range (21 per cent in girls; 20 per cent in boys). The diamond clearly leads in girls from 11 through 13, and at 15 and 16 years of age, occurring considerably more in girls than in boys. In spite of this fact, the diamond *first appears* as one of the two leading figures in boys at 7 and 8 years of age, and it *first predominates* in boys at 9 years.

SQUARE

This is the shape used most by boys. The range of average percentages used, from age to age, is greater in boys, and the average of percentages for all ages together is considerably greater in the boys (19 per cent in girls; 24 per cent in boys). Squares first predominate in boys at 5 years of age, and they continue to hold first or second place at every following age. In girls, squares share first place with the large triangle at 5 years of age, but they are not conspicuous after 10. In fact, the decrease in the use of squares in girls after 10 is one of the most striking trends in shape.

Thus the chief *age trends* are that the large triangle predominates in both sexes for the first 4 years of life; squares are most used from 5 to 10; but, from 10 on, girls favor diamonds and scalenes, boys diamonds and squares.

The main *sex differences* observable appear to be that, in general, boys tend to favor the use of squares and diamonds; girls, of diamonds and scalenes. Trends in girls are a little more clear cut and squares are first used conspicuously by boys.

CHAPTER 6

Color

Color is considered from four points of view: (1) the formal manner in which it is used; (2) the actual color or combinations of colors used; (3) the process of color use; and (4) the possible meanings of the different colors and combinations of color used.

FORMAL MANNER IN WHICH COLOR IS USED

Following Walker (1957), we have outlined five stages of possible use of color: (I) no evident color pattern; (II) partial use of color—no relation to form, or consistent with form; (III) one color only; (IV) full color pattern repeating form; and (V) color pattern adds significance to form. In determining the extent to which the present subjects respond at each level, we have considered girls and boys separately, and we also present separate tables for representational and nonrepresentational designs. (See Tables 18 and 19.)

Considering nonrepresentational figures, we find that for girls (Table 18) no evident color pattern is seen in the majority of productions from 2 through 4 years of age. After 4, more advanced use of color gains rapidly until, by 7 years of age, the largest number of subjects produce a full color pattern repeating form. At 8 to 10 years the use of color is slightly less mature. In fact, at 9 and 10 years a substantial number of girls make no evident use of color. At 11 years, however, and from then on except at 13 years, by far the majority of girls respond at level IV—full color pattern repeating form.

Boys are somewhat slower in achieving an adequate use of color. In boys, as in girls, from 2 to 4 years of age no color pattern is evident. Not until 12 years and after do the largest number of boys reach level IV.

As to *representational designs,* adequate use of color comes in a little later than with nonrepresentational designs, and there is less difference in the performances of girls and of boys. With girls there is no evident use of color before 4 years. Partial use of color consistent with form leads from 5 through 8 years. At 9 years it is nearly equaled by color pattern adding significance to form, and from 10 years on the color pattern adding significance to form predominates.

Table 18

USE OF COLOR IN NONREPRESENTATIONAL DESIGNS, NUMBER OF SUBJECTS IN EACH CATEGORY

Age in Years	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*11*	*12*	*13*	*14*	*15*	*16*
GIRLS															
Total Number of Cases	50*	40	32	28	19	22	25	29	24	25	32	33	27	26	23
I. No evident color pattern	**38**	**33**	**20**	9	5	4	5	**10**	**9**	4	6	7	3	3	2
II. Partial use of color															
a. No relation to form	10	0	1	**10**	3	4	3	1	1	3	0	4	1	3	3
b. Consistent with form	0	6	10	7	**7**	5	**9**	**10**	5	7	9	**10**	7	3	2
III. One color only	2	1	1	1	2	0	0	1	0	0	1	1	0	0	0
IV. Full color pattern repeating form	0	0	0	1	0	**9**	**9**	7	**9**	**9**	**15**	**11**	**15**	**17**	**16**
V. Color pattern adding significance to form															
a. Naturalistic	—	—	—	—	2	—	—	—	—	2					
b. Forms new figure	—	—	—	—	—	—	—	—	—	—	1	—	1		
BOYS															
Total Number of Cases	50*	34	27	19	13	12	16	15	16	17	21	21	24	28	24
I. No evident color pattern	**42**	**19**	**11**	3	**5**	**5**	**5**	**6**	1	4	5	1	2	1	1
II. Partial use of color															
a. No relation to form	8	1	4	1	0	0	2	3	2	3	1	0	1	3	2
b. Consistent with form		13	10	**15**	**6**	**5**	3	**5**	**6**	**5**	2	7	5	9	5
III. One color only	—	1	2	0	0	0	0	0	0	0	0	1	1	1	1
IV. Full color pattern repeating form	—	—	0	0	2	2	3	1	**7**	**5**	**12**	**12**	**12**	**14**	**12**
V. Color pattern adds significance to form															
a. Naturalistic															
b. Forms new pattern	—	—	—	—	—	—	3	—	—	—	1	—	3	—	3

---

* Figures were doubled at 2 years, since only 50 cases were used instead of 100 as at other ages.

Table 19

Use of Color in Representational Designs, Number of Subjects in Each Category

Age in Years	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*11*	*12*	*13*	*14*	*15*	*16*
GIRLS															
Total Number of Cases	0	10	18	22	31	28	25	21	26	25	18	17	23	24	27
I. No evident color pattern		**8**	**10**	6	**9**	0	1	0	0	0	0	0	0	0	0
II. Partial use of color															
a. No relation to form		2	3	1	6	1	5	3	3	3	3	0	2	0	0
b. Consistent with form		—	4	**11**	**9**	**14**	**10**	**8**	4	7	3	4	2	5	6
III. One color only		—	1	2	3	2	1	1	0	1	3	2	1	0	2
IV. Full color pattern repeating form		—	—	1	0	4	2	2	6	5	3	1	4	6	6
V. Color pattern adding significance to form															
a. Naturalistic		—	—	1	4	6	6	7	**12**	**9**	**6**	**10**	**12**	**11**	**12**
b. Forms new figure		—	—	—	—	1	—	—	1	—	—	—	2	2	1
BOYS															
Total Number of Cases	0	16	23	31	37	38	34	35	34	33	29	29	26	22	26
I. No evident color pattern		**12**	**9**	9	4	3	**9**	2	0	0	0	3	1	0	1
II. Partial use of color															
a. No relation to form		3	1	8	5	0	8	5	3	4	2	**10**	4	1	4
b. Consistent with form		0	**11**	**12**	**13**	**18**	**9**	**12**	8	10	**13**	4	4	**10**	4
III. One color only		1	2	1	2	4	1	5	2	3	2	1	0	1	0
IV. Full color pattern repeating form		—	—	—	7	2	2	7	**12**	**12**	7	4	**8**	6	**8**
V. Color pattern adds significance to form															
a. Naturalistic		—	—	1	6	9	5	4	8	4	5	5	7	2	7
b. Forms new pattern		—	—	—	—	2	—	—	1	—	—	2	2	2	2

With boys, as with girls, there is no evident color pattern before 4 years of age. At 4, partial use of color consistent with form appears, more strikingly than with girls, and this level predominates from 5 through 9 years. From then on, the use of color varies more from age to age in boys and is less mature than in girls, for the most part being, as Table 19 shows, either at level II (partial use of color) or level IV (full color pattern repeating form). The use of color is most mature at 10, 11, 14, and 16 years; least mature at 12, 13, and 15 years.

Though color is sometimes absent and sometimes used loosely or ineffectively, we did not, in this collection, find examples of what other investigators have described as "bizarre" use of color.

ACTUAL COLORS USED

The actual colors used have been determined both for single colors and for combinations of colors.

SINGLE COLOR

To determine which colors are used most at different ages, we have figured for each age, and for girls and boys separately, what percentage of all pieces used are blue, red, white, etc. These numbers are determined by figuring each child's product separately and then averaging. Thus if Girl A used, in all, only 3 pieces but all pieces were blue, blue would, in her case, make up 100 per cent of all colors used, even though in Girl B, who may have used 30 pieces in all, 3 blue pieces would make up only 10 per cent of the total.

Table 20

PERCENTAGE OF TOTAL NUMBER OF PIECES USED, IN EACH COLOR
(FIGURED BY INDIVIDUAL CHILDREN)

Age in Years	*Girls*						*Boys*					
	Black	*Blue*	*Green*	*Red*	*White*	*Yellow*	*Black*	*Blue*	*Green*	*Red*	*White*	*Yellow*
2	*22.0*	**24.0**	16.0	16.0	12.0	10.0	**25.0**	*22*	14	14.0	13.0	12.0
3	*18.0*	**21.0**	16.0	16.0	16.0	13.0	*19.0*	**27**	14	15.0	12.0	13.0
4	16.5	**24.0**	16.0	*17.0*	13.0	13.5	*16.0*	**29**	*16*	14.0	11.0	14.0
5	*19.0*	**35.0**	12.0	14.0	10.0	10.0	14.0	**37**	11	*15.0*	12.0	11.0
6	11.0	**39.0**	*14.0*	*14.0*	10.0	12.0	14.5	**34**	*17*	14.5	9.0	11.0
7	*17.5*	**32.0**	14.5	16.0	8.0	12.0	*17.0*	**38**	10	13.0	10.0	12.0
8	*17.5*	**24.0**	14.5	17.0	14.0	13.0	*18.5*	**27**	15	16.0	11.0	12.5
9	**20.5**	*20.0*	17.0	15.5	16.0	11.0	*21.0*	**36**	9	12.0	12.5	9.5
10	18.0	**21.0**	*19.0*	16.0	12.0	14.0	*21.0*	**25**	9	20.0	15.0	10.0
11	16.0	**22.0**	17.0	16.0	*18.0*	13.0	*17.0*	**26**	10	*17.0*	*17.0*	13.0
12	*17.0*	**21.0**	*17.0*	*17.0*	16.0	12.0	*19.0*	**22**	15	14.0	15.0	5.0
13	**18.5**	18.0	16.0	**18.5**	14.0	15.0	*17.0*	**25**	13	14.0	16.0	14.0
14	15.5	*18.5*	14.0	17.0	**22.5**	11.5	*17.0*	**22**	*17*	16.0	15.0	13.0
15	*19.0*	**22.0**	10.0	*19.0*	17.0	13.0	12.0	**27**	11	*19.0*	16.0	15.0
16	**20.0**	*19.0*	16.0	16.0	**20.0**	9.0	13.0	**29**	14	*16.0*	15.5	12.5
Totals	18	24	15	16	14	12	18	28	13	15	13	12

Numbers in heavy type are leading items; those in italics rank second.

Table 20 and Figures 3 and 4 show that rather clear-cut age trends and sex differences do exist for the colors used. For both girls and boys, averaging all ages together as well as for most single ages, blue predominates. This may be due to the fact that, following the rules determined at the First American Mosaic Conference held in Washington on May 13, 1950, pieces were arranged in our Mosaic box (from left to right and from top to bottom of the box) in this order: black, green, yellow, red, white, and blue, bringing blue, in each instance, nearest to the subject. Further research in which pieces are arranged in some different order is needed to determine the effect of order in the box on the actual use of color by the subject.

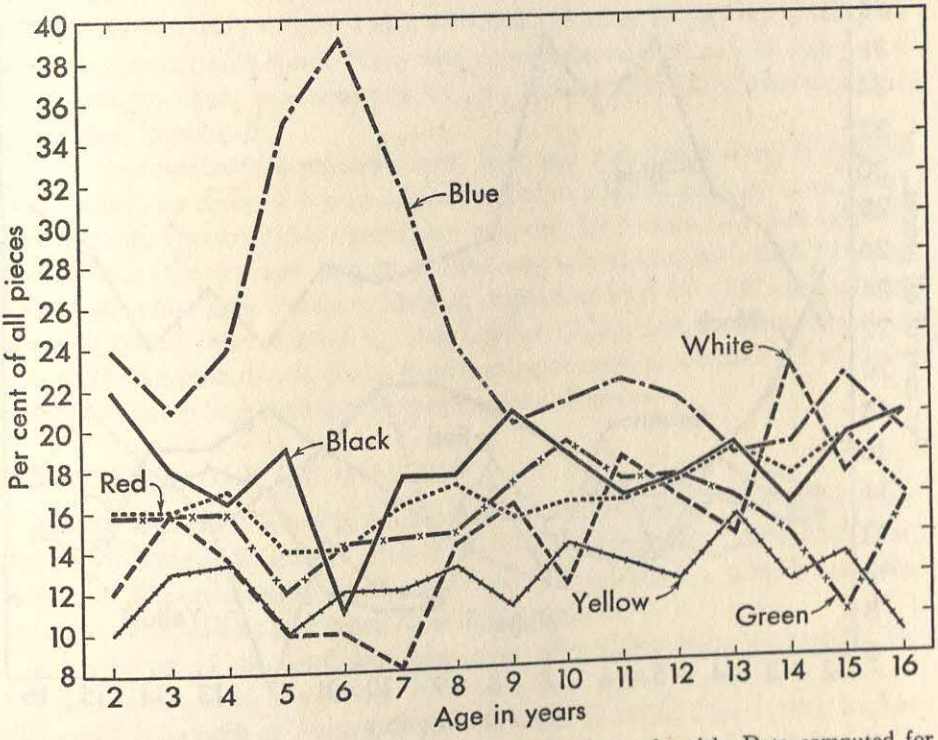

FIG. 3. Distribution (in per cent) of colors used at each age by girls. Data computed for each child separately, then averaged.

Careful study of Table 20 will reveal many interesting age changes. In brief summary, we note that, in girls, the color blue predominates at every age except 9, 13, and 14 years, and 16 years. At 9 years of age, black is used most; at 13, black and red tie for first place; at 14 years, white is used most. The color black holds second place at 7 of the 15 ages studied, ties with white for first place at 16 years, and leads all others at 9 years.

Exceptions to this predominant use of blue and black are 4 years, when red comes second; 6 years, when red and green tie for second place; 11 years, when white comes second; 12 years, when black, green, and red tie for second place; 13 years, when red ties with black for first place; 14 years, when white definitely comes first; 15 years when black and red tie for second place; and 16 years, when white ties with black, and blue is behind the leaders.

Averaging all ages together, we find that, for girls, the order of color use in descending order is blue (24 per cent), black (18 per cent), red (16 per cent), green (15 per cent), white (14 per cent), and yellow (12 per cent).

With boys the picture is not too different. Blue is used more than any other color except at 2 years of age. Black comes second except at 2, 5, 6, and 14 to 16 years. At 2 years, black leads; at 5, red comes second; at 6, green comes second; at 11, red, white, and black tie for second place; and at 15 and 16, red comes second.

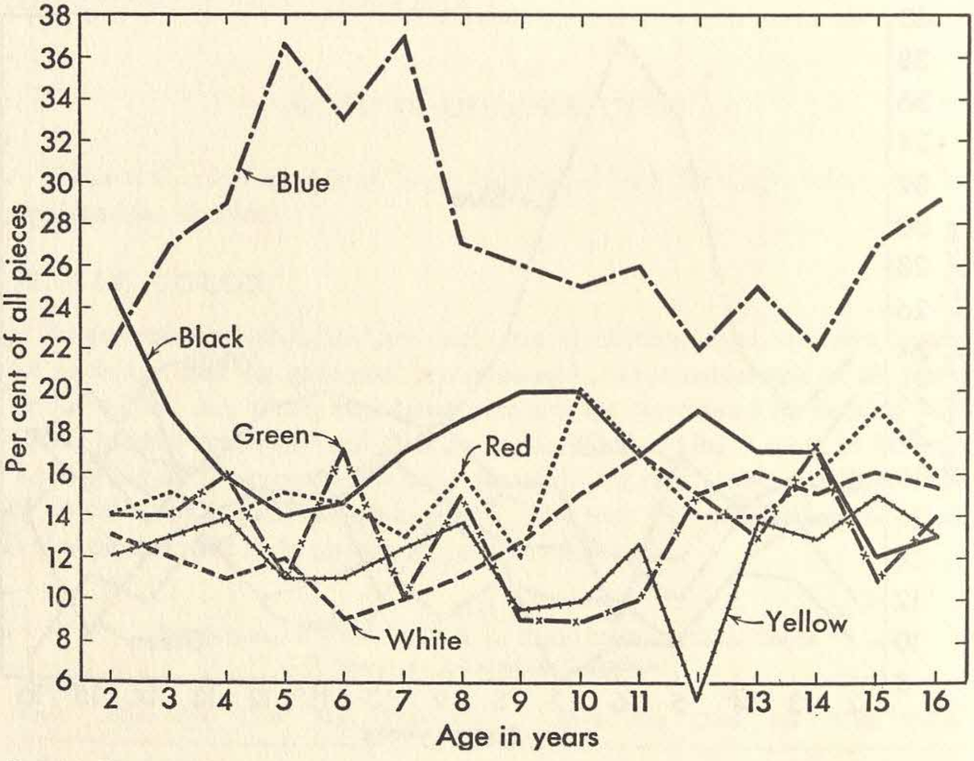

FIG. 4. Distribution (in per cent) of colors used at each age by boys. Data computed for each child separately, then averaged.

Averaging all ages together, we find that, for boys, the order of colors used (from most to least) is blue (28 per cent), black (18 per cent), red (15 per cent), white (13 per cent), green (13 per cent), and yellow (12 per cent). This is very similar to color use in girls.

Sex differences: Figures 3 and 4, which present these same data in graphic form, show clearly both similarities and the differences in the extent to which the two sexes use the different colors. In both, blue predominates except in girls at 9, when black leads; at 13, when red and black lead; at 14, when white leads; and at 16, when black and white lead; and in boys at 2 when black leads. But in boys the predominance of blue throughout is much more marked.

The only other major conspicuous difference is that green is used considerably more in girls than in boys.

As to the way in which color is used, in nonrepresentational designs, in both sexes the majority of children show no evident use of color from 2 through 4 years. At 5 years, boys' use of color is slightly more mature than that of girls. At 6 years, both predominantly exhibit partial use of color consistent with form. At 7 and 8 years, girls use color more maturely than do boys, girls exhibiting chiefly a full color pattern consistent with form, boys only a partial color pattern or no color pattern. At 9 years both regress in the use of color. At 10 and from then on, the majority of girls and a substantial number of boys use a full color pattern consistent with form. Thus, with nonrepresentational as with representational patterns, there is a tendency for girls to be a little more advanced than boys in their use of color.

As to representational patterns, both boys and girls reach level II (partial use of color) as early as 4 years. A substantial number of girls, however, reach level V (color pattern adds significance to form) by 9 years, boys not until 10. Boys do not give a major portion of their response at this level until 14 years. Boys at the older ages are more likely to respond at level IV (full color pattern repeating form) than at level V. Also, boys at 12, 13, and 15 years drop back to level II, but girls do not. Thus, in general, girls seem to use color a little more maturely than do boys in making representational objects.

COMBINATIONS OF COLORS

Though the use of colors is an extremely individual matter, and quantitative analysis yields actually little of great value to a consideration of the use of color, we should like to consider briefly those instances in which a subject uses only one color, or at least no more than three different colors.*

As to the use of one color only, blue is the color chosen most exclusively. We find blue alone used as follows: in 3 girls at 5 years; 5 girls at 6 years; 2 girls and 2 boys each at 7 years; 4 boys at 9; 2 boys at 10; 2 girls and 2 boys at 12; 2 boys at 15; and 2 boys at 16. Other conspicuous use of a single color is all black in 2 boys at 10 years; 2 girls at 12; 2 girls at 13; and 2 girls at 15. All white, all yellow, or all green occur occasionally but, except for 2 all-white products at 11 years, never in more than 1 child at an age.

At certain ages, and in some subjects, also, there appears to be an emphasis on the use of certain limited combinations of colors. Table 21 presents data on the number of subjects at each age who use three or fewer colors, and also the number who use one color only.

The actual combinations of colors used most are given under the sections on color in the individual age chapters. They will not be reviewed here because the numbers involved are, in most instances, small. As Table 21 indicates, the ages most conspicuous for the use of only a few different colors are, in girls, 14, 13, 12, 5, and 16, in that order; for boys, 7, 9, 11, and 13, in that order.

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* An exception is made for the fairly common combination of red, white, blue, and black which is included in this analysis.

Outstanding combinations are: green and two others in boys at 5 years; blue and white, or black, blue, and white in boys at 9; red, white, and blue, or red, white, and black, or red, white, blue and black in boys at 10; red, white, blue, and black in boys at 11; blue and white, or blue and red, or red, white, and blue in girls at 11; red, white, and blue in boys at 12; black and yellow, or black, yellow, and white in girls at 13; green and one or two other colors in both girls and boys at 14; red, white, and blue in boys at 15; red and black, or red, white, and blue in girls at 15; green and one or two others in both girls and boys at 16. There is less concentration of color in girls.

Table 21

Number of Subjects Using One Color Only or Three Colors or Fewer

	Girls		*Boys*	
Age in Years	*Three or Fewer*	*One Only*	*Three or Fewer*	*One Only*
4	9	2	15	2
5	14	3	15	1
6	13	5	15	2
7	12	2	22	4
8	7	1	9	2
9	8	2	19	5
10	7	0	17	4
11	13	1	18	3
12	14	4	11	2
13	15	3	18	2
14	19	1	12	1
15	6	0	13	2
16	14	2	15	2 (?)
Totals	151	26	199	32

PROCESS OF COLOR USE

In a tabular treatment of the use of colors, we deal with color as it appears in the child's finished product. Thus, if there is no patterned finished product, color is not scored as being used in a patterned way.

Even in early nonrepresentational nonpatterned products, however, there can be some pattern to the *process* of using colors even if not in the final product. It is difficult to analyze this process systematically, but we shall comment briefly on some of our observations as to the *way* in which color is used at the different ages:

TWO YEARS

The child of this age tends to pick up a handful of pieces (often blue, since blue comes nearest to hand) and drops or scatters them on the paper. He may stop there, or he may then proceed to drop or scatter other handfuls of pieces. This results, often, in masses of blue, masses of red, etc. This color use looks, in the final result, more selective than it actually is in process.

THREE YEARS

The same thing is true at 3. Clumps or clusters or, in some instances, lines of color result from the child's dropping or placing a handful of pieces (all of one color as he takes them from the box) onto the paper. With some advanced subjects there may be several such clumps or clusters, each of a different color, though most have an extra piece or pieces of some other color. The use is not carefully selective.

FOUR YEARS

Although for the majority of subjects the total product still cannot be classed as good color repeating form, for many there are good islands of correct color and form. The best example is probably the typical 4-year-old circle made of 6 large triangles, usually all the same color. There is also considerable matching or contrasting of groups of two colors. Thus, although the total product may not be impressive as far as color use is concerned, there is evidence of considerable, somewhat effective, interest in and use of color.

FIVE YEARS

Experimentation with different types of combinations seems, at this age, to stress form almost more than color. Nevertheless, a substantial number of girls and the majority of boys now show partial use of color consistent with form. Although the use of color is extremely variable, many subjects show marked interest in combining pairs or groups of the same contrasting colors. This no longer seems to occur manipulatively or by chance, but appears strongly intentional and is often quite effective.

SIX YEARS

The child's process in the use of color is now, in superior subjects, quite advanced. Some of the more superior actually use all six colors, each in a different shape, in forming a product, or may combine six colors, all in the same shape. Others, even more superior, may treat one half of a form in one sort of a color arrangement, the other half in a different color arrangement. Or, in a four-sided pattern, each one of the four sides may be of a different color or type of color combination.

Although there is considerable massing of colors, we find also marked interest in the combination of twosomes, threesomes, or even foursomes of the same shape or color. Color tends either to mass (2, 3, 4, or more pieces of the same color) or to alternate. Black and white, especially, are alternated more than earlier.

SEVEN YEARS

Alternation of colors now seems more conspicuous than massing, and the majority of nonrepresentational products are made with partial or full use of color repeating form. Subjects thus now show considerable skill and a whole new concern, in their use of color.

Since often a product at this age is made of a serial line-up of single pieces or of simple patterns such as 2-piece houses, this allows for considerable emphasis on variety of color; that is, color rather than shape is varied. Thus the product may consist of a whole row of different-colored houses; or the roof of each house and the body of the house may be of two contrasting colors. Often, all six colors are used serially. The page may thus consist of several identical designs, but each in a different color. In frame-and-item designs, often the total color arrangement is accurate, with, for instance, the two sides and the top and bottom balancing.

EIGHT YEARS

Again, as at 7, more than half the subjects use a color pattern which partially or wholly repeats form. There is great variety of the *kind* of color usage here, and apparently marked interest in different possible uses of shape and color. Interest seems almost experimental, though often extremely effective.

As at 7, a simple pattern (such as a basic 4-year-old circle) may be made of six different colors. A determined use of all six colors in a simple pattern, however, may be more characteristic of 7. Possibly more characteristic of 8 is working with a certain *number* of colors. Thus a series of designs may each include three, or four, different colors.

In many patterns, both colors and shapes are correctly placed except for some *one* color or shape which is incorrect, spoiling the perfection. Especially conspicuous is balance of color on two sides of a symmetric pattern.

NINE YEARS

The majority of subjects still show *partial* use of color pattern consistent with form. Color is being used more effectively than earlier, in both representational and nonrepresentational products. It is not until later, however, that the majority show full color pattern repeating form, and at 9 there are still many small errors. In fact, most conspicuous is the single piece placed incorrectly, spoiling the otherwise perfect color arrangement. Most products, in spite of this, are quite effective in the use of color.

Earlier use of all six colors, used apparently for the sake of getting them all in, is immature for 9 years. There is emphasis on the use of black, blue, and white.

TEN AND ELEVEN YEARS

Color is being used with increasing accuracy and effectiveness, but no especially new ways of using color are noted at these ages.

TWELVE YEARS AND AFTER

From here on, with few exceptions, the majority of subjects are able to produce a full color pattern reproducing form (in nonrepresentational products) and to use color in an effective way in making objects and scenes.

SIGNIFICANCE OF INDIVIDUAL COLORS

In discussing the evaluation of the use of colors as much as in relation to any formal aspect of the Mosaic product, Lowenfeld emphasizes the need for individual, subjective evaluation in the context of the total product and also in relation to what the color means to the individual subject. That is, she warns against any such oversimplification as the assumption that any single color inevitably stands for or correlates with any single personality factor or emotional component of personality. The word "color" is not listed in the index of her 1954 text.

Lowenfeld repeatedly cautions against making any generalization about the meaning of certain colors. Thus she comments (1954, p. 90):

> It is a common error to treat all black color . . . as indication of depression, and all red as representing anger and aggression. Both can be used in a purely decorative manner. At times the maker of a pattern containing a large element of black will say, "I like black—it throws up the other colors." Similarly, red can be referred to by the maker of a pattern as being cheerful or energetic as well as angry.

In spite of these warnings, Lowenfeld has given us, both in her 1954 book and in a paper given at the First American Mosaic Conference in Washington in 1950, some clues as to the possible significance of the individual colors. Considerably abstracted, this information follows.

BLACK

Black may be used merely for realistic or decorative purposes. However it may, of course, suggest depression, especially when black pieces form the center of a slab or of an "incoherent" pattern.

Black and white. "According to the context in which a design occurs, the exclusive use of black and white can either be expressive of aesthetic values or of retreat from emotional experience or expression."

Black and yellow. These colors combined make a more severe, angrier, and more pathological combination than do black and white.*

* In our collection we find rather conspicuous use of black and yellow at 13 years of age. There are 2 black and yellow designs made by girls, plus 3 black, white, and yellow. There are also 1 black and yellow by a boy, plus 1 black, yellow, and one other color.

BLUE

Basically, this color suggests quietness, coolness, coldness. In Catholic countries where blue and white are the colors of the Virgin Mary, Lowenfeld feels that the use of blue can be "overdetermined."

RED

Red is a very important element in the Mosaic responses, but only with experience can judgment be acquired as to the significance of red in any given pattern. Red can be used to express a wide variety of feelings, ranging through anger, warmth, activity, vitality, and cheerfulness. Used directly to represent ideas such as fire or blood, it can be expressive of anxiety. "As with black, it is only in conversation with the subject that it can be ascertained whether the color has been used by him because it is pleasing to him and appears to him to have a cheerful connotation, or whether it expresses anger or destructiveness" (1954, p. 231).

GREEN

Green may be considered a more or less neutral color which balances other colors. In naturalistic patterns it frequently is used to indicate vegetation, grass, or "growingness." Like blue, when used alone, it "gives no evidence of neurosis in the subject."

WHITE

Although white can be used for purely decorative effect, in European patterns it "usually has the significance of negation and suggests passivity, emptiness, deadness, depersonalization. If it appears in the context of the pattern, it has much the same significance as a hollow center; if on the outside it indicates a certain neutrality or inability or awkwardness in social relations. If white occurs at the base of a pattern, a feeling of insecurity and nothingness is indicated." However, Lowenfeld finds that white is used much more in American than in European patterns. She believes that this may be due to the prevalence of white as the outside color of houses and churches in New England.*

YELLOW

This is, in Europe, generally considered to be a cheerful color and is used almost uniformly by children to represent the sun. Some American psychiatrists, however, associate it with ideas of dreariness or dullness. Lowenfeld has not met with any all-yellow patterns, although in our collection we find all-yellow patterns in 1 boy at 6 years of age and in 1 at 11.

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* "Colors mean so many different things to different people. It is essential that before any interpretation of color is made the tester should draw up a table of color association common in his area, with which those used by the subject should be compared" (Lowenfeld, 1954, p. 232).

CHAPTER 7

Naming

LEVEL OF NAMING

The naming of products has been classified both as to manner of naming and as to the actual products named (see Tables 22 and 23). Although the first item in the classification of *manner of naming*—"unnamed"—occurs most at the youngest ages, there are some subjects at all ages through 16 who cannot, or do not, name their products.

Items 2 through 6, in that order, give evidence of increasing maturity: (2) color naming; (3) pieces scattered, each piece named; (4) pieces scattered, whole product named; (5) several pieces grouped, though inaccurately, and named; and (6) same, product slightly resembling object named. Since these first six stages of naming, which indicate increasing maturity of response, occur little after 5 years of age and do not occur at all from 8 years on (except for "unnamed"), Table 22 indicates stages of naming only through 9 years. As this table shows, the subject has reached approximately an adult manner of naming by 6 years of age.

The classifications of naming (7) through (11) indicate different *kinds* of response but do not represent different stages of maturity. They include (7) object resembling object named; (8) several objects named; (9) design named design; (10) mere description (star, decoration, or abstract); and (11) scene so named.

THINGS NAMED

Table 23 classifies all *products as they were named,* as far as these names occurred conspicuously at more than one age level. Twenty-two topics were tabulated, including a category for objects not named. The category "food" (considered in the Rorschach as an immature response) occurred only in 4 subjects at 2 years of age and in 2 at 4 years, and thus was omitted. "Road" or "sidewalk," which occurred fairly conspicuously at 3 years of age (3 cases),

Table 22

MANNER OF NAMING

Age in Years	*2**			*3*			*4*			*5*			*6*			*7*			*8*			*9*		
	G	*B*	*All*	*G*	*B*	*All*	*G*	*B*	*All*	*G*	*B*	*All*	*G*	*B*	*All*	*G*	*B*	*All*	*G*	*B*	*All*	*G*	*B*	*All*
1. Unnamed	32	32	64	17	23	40	16	21	37	6	5	11	4	3	7	3	6	9	6	3	9	4	4	8
2. Color naming				6	5	11	5	0	5	1	1	2	0	0	0	0	0	0	1	0	1			
3. Pieces scattered, each named	0	2	2	4	2	6	4	2	6															
4. Pieces scattered, whole product named†	18	16	34	11	1	12	3	1	4	0	1	1	0	1	1									
5. Several pieces grouped, though inaccurately, and named	—	—	—	3	7	10	5	11	16	2	3	5	0	1	1	1	0	1						
6. Same, product slightly resembling object	—	—	—	4	0	4	4	5	9	5	6	11	1	0	1	1	0	1	1	0	1			
7. Object resembling object named	—	—	—	0	1	1	7	4	11	14	19	33	20	22	42	10	16	26	13	17	30	9	23	32
8. Several objects named	—	—	—	0	1	1	0	0	0	5	4	9	1	1	2	1	2	3	3	4	7	3	1	4
9. Design named design	—	—	—	3	4	7	5	1	6	14	4	18	15	8	23	15	8	23	11	11	22	22	12	34
10. Mere description (star, decoration, or abstract)	—	—	—	2	0	2	1	2	3	0	2	2	0	1	1	3	1	4	4	1	5	2	0	2
11. Scene so named	—	—	—	0	6	6	0	3	3	3	5	8	9	13	22	16	17	33	11	14	25	10	10	20
Totals	50	50	100*	50	50	100	50	50	100	50	50	100	50	50	100	50	50	100	50	50	100	50	50	100

* Numbers doubled.

† Since at 2 and 3 years some of these clusters of figures, named as objects, in no way resemble objects, they are not so classified in Table 13, which classifies types of design, or in Table 44 in Chapter 24.

occurred thereafter in only 2 cases at 4 years; 1 at 5; 1 at 6, 8, and 9 years; and 2 at 7. This also was omitted.

As Table 23 shows, the leading content categories, all ages combined, are, in order: design, unnamed, scene, house, person, building other than house, tree, airplane, rocket, or kite, boat. If "house" and "other building" are combined, they become the second leading category, exceeded only by design.

Age changes in these leading categories occur as follows: There is a steady increase in the occurrence of the response "design" until 9 years. After this age it remains rather constant.

The number of subjects who cannot say what they have made makes up the second leading category. This number decreases sharply after 4 years of age, with slight subsequent increases at 12, 13, 15, and 16 years.

Next frequently come scenes, which increase to peaks, at 7, 8, and 10 years. There are subsequent high points at 14 and 16 years. House, too, increases steadily through 8 years, after which it diminishes sharply.

Person* increases steadily to a high point at 10 years, falls off slightly, and then reaches another high point at 15 years. Building other than house ranges only from 2 to 16 occurrences at an age, with high points at 5, 7, 8, and 16 years. The number of boats given ranges with age from 1 to 9, with high points at 2, 7, and 10 years.

Airplane or rocket reaches its high point at 5 to 10 years, then falls off sharply. Tree increases slightly but steadily through 8 years of age, then decreases slightly and holds steady at 9 to 11 years, then decreases, and increases slightly again at 14 and 16 years.

Chapter 24 discusses more fully the developmental changes in the following content categories: people, houses, trees, scenes.

MOVEMENT

Lowenfeld (1960) considers it important to note the extent to which movement, implied or specifically expressed, occurs in the Mosaic patterns of children. Careful analysis reveals only 18 examples of actually stated or directly implied human or animal movement occurring in boys and only 16 in girls in our entire collection of 1500 Mosaics. Examples are "men working," "boy going to bed," "knight going up to castle," "twins sliding," and "sailor and girl dancing." If we add objects or trees in motion, directly stated, these totals increase to 23 in boys and 18 in girls. These examples occur throughout the entire age span from 3 through 16 years; they occur little before 9 years of age and most from 13 to 16.

Since Lowenfeld includes in her "movement" category "representational designs containing or implying mechanical movement, as with car, plane, boat" as well as human movement, we have listed all these as well. This is rather inconsistent, because, although for humans we require that movement be

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* Each separate item, such as person, tree, house, etc., is counted both when it occurs alone and when it occurs as part of a scene. Any number of houses or trees or people are counted once only for each subject who gives them.

Table 23

NAMING OF PRODUCTS

Age in Years	*2**		*3*		*4*		*5*		*6*		*7*		*8*		*9*		*10*	
	G	*B*	*G*	*B*	*G*	*B*	*G*	*B*	*G*	*B*	*G*	*B*	*G*	*B*	*G*	*B*	*G*	*B*
Design	4	0	2	4	7	1	14	2	14	11	15	10	12	11	22	12	19	13
Can't say	32	32	17	23	16	21	3	5	4	3	4	5	7	3	5	3	5	3
Decoration, star	0	2	2	0	1	2	0	4	2	1	2	1	5	2	2	0	3	2
House	2	4	7	4	8	5	11	14	13	15	11	19	13	10	6	7	2	5
Other building	2	0	2	2	1	3	8	4	1	3	5	5	6	10	4	2	2	3
Window, door, etc.	2	0	0	2	2	2	2	1	2	1	0	1	2	3	1	0	0	0
Merry-go-round, windmill, etc.	2	0	0	3	3	3	3	0	2	0	2	0	1	0	1	1	0	0
Person	0	0	0	1	2	0	1	4	1	3	3	5	3	5	4	7	5	7
Face	0	0	0	0	1	0	0	1	3	1	0	1	0	0	1	0	1	0
Animal	0	2	2	0	0	1	2	5	1	0	1	1	2	5	2	3	8	2
Scene	0	0	0	5	0	2	3	2	9	13	14	16	11	14	9	11	14	13
Arrow, rocket, airplane, kite	0	0	1	1	1	1	1	8	4	8	3	4	2	7	2	5	0	8
Car, train	0	2	2	4	1	1	0	2	0	0	0	0	0	1	0	1	0	2
Boat	2	6	1	1	1	5	0	1	1	1	2	6	2	1	1	6	4	5
Grass	0	0	1	0	0	0	1	1	5	5	4	2	1	2	2	1	2	1
Sky	0	0	1	1	0	0	0	2	6	7	5	6	2	2	2	1	0	1
Tree	0	0	3	2	1	2	1	2	3	2	4	1	5	4	5	1	4	2
Flowers	0	0	0	0	0	1	1	1	2	0	2	0	3	0	2	1	2	0
Water	0	0	0	1	1	0	0	0	0	0	1	4	2	2	0	1	4	5
Sun, moon	0	0	0	1	2	1	1	1	1	3	7	4	3	1	1	2	0	0
Abstract	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
Pyramid	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1

* Number doubled.

actually mentioned or *directly* implied, as in "football game," for mechanical movement we have followed Lowenfeld's suggestion of assuming that the mere listing of car, plane, or boat implies movement. (Actually, it might as readily be assumed that the mere mention of human also implies potential movement.) This calculation indicates that for girls there are 61 indicated or implied instances of mechanical movement, 16 indicated or directly implied of human movement; for boys there are 161 of indicated or implied mechanical movement, 18 of indicated or directly implied human movement. For girls, mechanical movement is found most from 4 through 10 years; for boys, from 3 through 13 years.

SEX DIFFERENCES

In naming, sex differences are, for most categories, slight. Thus girls and boys make and name approximately an equal number of buildings other than house, persons, faces, scenes, sky, abstract, water. Boys do make more houses than girls except at 3, 4, 8, 12, and 14 years, when differences are small.

Such sex differences in content as do exist, however, are quite striking. From the content categories most frequently observed, we selected what we considered to be the outstandingly masculine symbols—boat; car and train; and airplane,

Table 23 (Continued)

Age in Years	*11*		*12*		*13*		*14*		*15*		*16*		*Totals*			*Rank*
	G	*B*	*G*	*B*	*G*	*B*	*G*	*B*	*G*	*B*	*G*	*B*	*G*	*B*	*All*	*Order*
Design	17	13	12	11	14	10	14	15	18	11	15	16	199	140	339	1
Can't say	6	1	14	5	12	7	2	3	4	11	9	8	140	133	273	2
Decoration, star	3	4	4	3	3	1	1	0	2	5	2	1	32	28	60	
House	2	3	5	2	1	3	2	2	2	3	1	4	86	100	186	4
Other building	2	5	1	2	1	3	3	4	0	2	10	2	48	50	98	6
Window, door, etc.	0	0	0	0	0	0	0	0	0	0	0	0	11	10	21	
Merry-go-round, windmill, etc.	0	0	0	0	0	0	0	0	0	0	0	0	14	7	21	
Person	4	4	5	4	2	4	5	4	11	3	6	3	53	54	107	5
Face	0	1	1	3	1	4	1	3	2	1	0	1	11	16	27	
Animal	6	1	5	1	3	1	4	2	3	1	4	1	43	26	69	
Scene	8	4	7	4	5	10	10	11	12	6	16	5	118	116	234	3
Arrow, rocket, airplane, kite	0	4	0	4	0	3	0	2	1	1	0	2	15	58	75	8
Car, train	0	4	0	5	1	5	0	2	0	5	0	3	4	37	41	
Boat	2	5	1	3	0	3	1	3	3	1	4	3	25	50	75	9
Grass	2	1	2	1	1	0	0	0	3	0	7	0	31	14	45	
Sky	1	0	0	0	0	1	0	0	3	0	7	3	27	24	51	
Tree	6	0	1	0	3	2	5	4	5	2	7	2	53	27	80	7
Flowers	6	1	3	1	4	0	3	1	3	0	2	0	33	6	39	
Water	3	0	2	1	1	1	2	1	1	0	3	1	20	17	37	
Sun, moon	0	0	0	0	0	2	2	1	1	0	1	0	19	16	35	
Abstract	0	0	1	0	2	4	1	0	0	2	4	4	8	11	19	
Pyramid	1	2	1	0	0	1	0	2	0	0	0	1	3	8	11	

rocket, arrow, kite—and also what we considered to be the outstandingly feminine symbols—grass, tree, flower.

Table 45 shows that, for all ages combined and also for most of the individual ages, boys clearly surpass girls in the use of the presumably masculine symbols, and girls surpass boys in the use of the supposedly feminine symbols. Thus, whereas girls, in all, give 33 flowers responses, only 6 boys make flowers; whereas 58 boys make figures in the airplane-rocket category, only 15 girls make such figures; and there are 35* cars and trains made by boys as against 4 made by girls. For all masculine symbols combined, boys have a total score of 137 against 42 for girls; for all feminine symbols combined, girls have a total score of 117 as against 48 made by boys.

* Plus 2 at 2 years, not included in Table 45.

CHAPTER 8

Other Formal Properties of Products

NUMBER OF PIECES

The average number of pieces used—both means and medians—was figured for boys and girls separately, at each age from 2 through 16 years. Table 24 gives both mean and median numbers used, for the two sexes separately, at succeeding age levels.

Table 24

Average Number of Pieces Used per Child at Each Age

	Girls		*Boys*	
Age in Years	*Mean*	*Median*	*Mean*	*Median*
2	26.32	20.00	27.16	23.00
3	28.42	24.50	26.59	20.00
4	26.72	20.00	24.42	16.00
5	21.22	14.00	28.40	20.50
6	24.26	20.00	22.44	17.50
7	26.92	15.50	25.50	21.00
8	27.60	23.50	34.10	25.50
9	30.40	29.00*	27.30	24.00
10	34.60	35.00	37.50	30.50
11	34.10	31.50	34.66	25.50
12	34.50	30.50	29.00	26.00
13	36.30	28.00	30.89	28.50
14	38.20	37.50	33.34	32.00
15	35.50	27.50	30.40	27.00
16	36.10	35.00	30.68	24.50

* Two types of 9-year-old pattern in girls—small focal, and large "neurotic" all over the board.

MEDIANS

The over-all age trends for boys and girls are very similar, though with some marked discrepancies at certain ages. In girls there is an over-all age change from a median of 20 pieces per product at 2 years of age to a median of 35 at 16. Only at 14 is this median of 35 exceeded by one of 37.5. With boys, the age flow is from a median of 23 pieces per product at 2 years to one of 24.5 at 16, with the high point of 32 at 14 years.

The high and low points for the two sexes come at somewhat different times. High points for girls (that is, most pieces used) come at 10, 14, and 16 years; for boys, at 10 and 14 years. Low points for girls are at 5 and 7 years; for boys, at 4 and 6.

MEANS

The means, being more influenced by the extreme productivity or underproductivity of individual cases, tell a somewhat different story. For girls, there is a rather steady increase from a mean of 26.32 pieces at 2 years to a peak of 38.2 pieces at 14, and then a slight decrease to 36.10 at sixteen. With boys the over-all change is from a mean of 27.16 at 2 years to a peak of 37.5 at 10 years, and then a decrease to 30.68 at 16.

The high points of productivity here are 38.2 pieces at 14 for girls; 37.5 at 10 for boys. Low points are 21.22 at 5 and 24.26 at 6 for girls; 24.42 at 4 and 22.44 at 6 for boys.

SEX DIFFERENCES

At any one age these tend to be rather marked, and the high and low points for the two sexes occur, as the table shows, at somewhat different times. The over-all trends, however, are somewhat similar, and the average of all means (except for 2 years when there are only 50 cases used) is 31.05 pieces for girls and 29.84 for boys—a slight but positive difference in favor of the girls.

TIMING

The total time used by each subject for each product was recorded, and means and medians were computed for each sex at each age level. The subjects were allowed to use as much time as they wished, except in the rare instances when they used as much as 20 minutes, at which point they were stopped. Table 25 presents these data.

For both medians and means, the total over-all age changes follow a similar course. For the means, there is a general increase in the time used to complete a single product, as the child grows older, from an average of 4:22 minutes per child at 2 years for the girls and of 5:21 minutes per child for the boys, to peaks of 11:35 minutes at 12 years for the girls and of 12:31 at 11 years for the boys. Then the average time decreases gradually to 8:45 at 16 years for girls and 8:47 at 16 for boys.

The median times follow almost exactly the same course, the longest times for girls being 10 minutes at 11 and 14 years, each, and 12 minutes for boys at 11.

Sex differences are not conspicuous except that there are somewhat less sharp changes from age to age in girls, and that there is a very sharp drop in the median time for boys at 16 years which is not found in girls. Averaging the means for all ages (except 2 years where there were only 50 cases in all) gives an average time for all girls at all ages of 8:8 minutes; for all boys at all ages of 8:2 minutes.

Table 25

TIME IN MINUTES REQUIRED FOR EACH CHILD TO COMPLETE HIS PRODUCT

	Girls		*Boys*	
Age in Years	*Mean*	*Median*	*Mean*	*Median*
2	4:22	4:30	5:21	5:00
3	6:31	5:00	6:34	5:00
4	7:56	6:00	7:13	5:00
5	6:24	5:00	6:47	5:00
6	6:38	5:30	5:37	4:30
7	8:03	5:30	6:50	5:00
8	8:06	7:00	9:02	8:00
9	8:56	8:00	6:44	5:30
10	10:58	8:00	9:58	9:00
11	11:16	10:00	12:31	12:00
12	11:35	9:30	8:33	6:30
13	10:25	8:30	11:48	9:00
14	10:20	10:00	9:17	9:30
15	10:30	8:00	11:00	10:00
16	8:45	6:30	8:47	6:00

SYMMETRY

All products which show symmetry or an approximation to symmetry have been checked both as to symmetry of placement on the paper and as to symmetry of the construct itself.

SYMMETRY OF PLACEMENT

This is considered both for (A) symmetrically placed single figures (that is, a single figure centered horizontally on the paper) and for (B) over-all designs which are arranged symmetrically on the paper. These latter include a complex design with masses of pieces fairly well balanced from side to side, several figures spaced evenly on the paper, or a well-balanced scene. Side-to-side symmetry only—not up and down—is considered.

Table 26 shows a generally increasing symmetry of placement, with high points at 8 to 10 years and again at 14 to 16 years. Low points—that is, the product is most asymmetric—occur at 5 years and at 11 to 13 years. Symmetry of placement does not appear to be an extremely important aspect of the Mosaic product.

SYMMETRY OF FIGURE

This category implies (A) that pieces on either side of an imaginary central dividing line balance each other regardless of whether the construct is a single

Table 26

Symmetric Placement of Figures on Paper

Age in Years	*5*		*6*		*7*		*8*		*9*		*10*		*11*		*12*		*13*		*14*		*15*		*16*	
	G	*B*	*G*	*B*	*G*	*B*	*G*	*B*	*G*	*B*	*G*	*B*	*G*	*B*	*G*	*B*	*G*	*B*	*G*	*B*	*G*	*B*	*G*	*B*
A	2	3	5	3	3	0	6	4	5	5	2	6	3	3	3	6	6	5	8	7	8	5	7	11
B	5	3	7	7	9	9	9	9	10	7	9	8	8	4	6	2	3	5	4	4	4	3	4	3
Totals	7	6	12	10	12	9	15	13	15	12	11	14	11	7	9	8	9	10	12	12	12	8	11	15
	13		22		21		28		27		25		18		17		19		24		20		26	

A = symmetrically placed single figure; B = symmetrically placed over-all structure.

Table 27

Symmetry of Figure

Age in Years	*5*		*6*		*7*		*8*		*9*		*10*		*11*		*12*		*13*		*14*		*15*		*16*	
	G	*B*	*G*	*B*	*G*	*B*	*G*	*B*	*G*	*B*	*G*	*B*	*G*	*B*	*G*	*B*	*G*	*B*	*G*	*B*	*G*	*B*	*G*	*B*
A	5	3	6	5	7	5	11	7	12	14	4	15	9	11	12	14	13	17	20	24	15	17	13	19
B	7	1	7	5	9	8	11	8	8	5	10	6	5	4	9	4	6	4	4	2	4	6	3	5
Totals	12	4	13	10	16	13	22	15	20	19	14	21	14	15	21	18	19	21	24	26	19	23	16	24
	16		23		29		37		39		35		29		39		40		50		42		40	

A = completely symmetrical; B = symmetric, but 1 or 2 pieces incorrectly placed.

figure or a scene or multiple figures covering all or much of the paper; or, (B) that the figure is accurately symmetric as in (A), except that one or two pieces may be inaccurately placed.

Shape only—not color—is considered here. All products are considered, both representational and nonrepresentational. This assessment of symmetry was made for products from 5 years through 16 years.

Table 27 shows clearly increasing symmetry of figure with increasing age. With only a slight drop at 11 years, symmetry increases steadily until its peak at 14 years, when 50 per cent of subjects make symmetric figures, and then decreases very slightly at 15 and 16 years. Completely symmetric figures exceed figures in which symmetry is slightly imperfect increasingly from 9 to 16 years. As to sex differences, more girls than boys make symmetric figures at 5 to 9 years and at 12 years. Boys' figures are the more symmetric at 10 and 11 years and at 13 to 16 years. Symmetry drops suddenly in girls at 10 and 11 years and again at 15 and 16 years. In boys, it drops sharply only at 11 years.

For the total age range, almost an identical number of girls and boys make symmetric patterns, but there is a slight tendency throughout for boys' products to become increasingly symmetric, whereas symmetry falls off slightly in girls at 15 and 16 years.

Lowenfeld's finding of increased symmetry at 8 years is somewhat borne out in that the high point for symmetric placement on paper does occur at 8 years, and there is a definite increase of symmetric figures at 8 years, though figures at 9 and 10 years are fully as symmetric as those at 8.

COMPACTNESS

The individual pieces composing a figure can form a pattern which fits together compactly, is spaced over the tray, or is an intermediate mixture of both methods. Most designs are quite easily rated on a five-point scale of this dimension.*

To rate level I, no two pieces of the design touch at any point; to rate level V, every piece must contact another piece along the length of at least one edge. (Some leeway is allowed here for difficulties of sheer motor manipulation. Where the total pattern indicates that the maker's intent was to make a compact pattern, slight spacing between some pieces may be interpreted as slipping, and the design may be classified as compact.) Level III includes those designs that use both methods about equally. Intermediate forms more closely resembling Levels I or V are classed, respectively, as II and IV. The quite common method of placement of pieces with only the points touching is classed as Level II.

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* This classification, as well as this description of the different levels, follows Walker (1957). Although this property of products is an important one from the standpoint of classification, and from the point of view of personality evaluation, we have given it relatively little emphasis in the descriptions of age levels which follow.

Table 28

Compactness of Design, Girls, Number of Designs at Each Level of Compactness

	Representational					*Nonrepresentational*					*Mixed*					*All*				
Age in Years	*I*	*II*	*III*	*IV*	*V*	*I*	*II*	*III*	*IV*	*V*	*I*	*II*	*III*	*IV*	*V*	*I*	*II*	*III*	*IV*	*V*
2*	—	—	—	—	—	16	14	14	4	2	—	—	—	—	—	16	14	14	4	2
3	—	3	1	3	—	12	15	11	3	2	—	—	—	—	—	12	18	12	6	2
4	2	3	2	5	6	5	7	8	6	4	—	—	1	1	—	7	10	11	12	10
5	—	2	6	7	10	2	1	5	6	9	—	—	—	—	2	2	3	11	13	21
6	1	5	6	11	9	—	1	3	5	9	—	—	—	—	—	1	6	9	16	18
7	1	—	8	11	7	4	2	6	4	6	—	—	—	1	—	5	2	14	16	13
8	—	2	7	8	8	3	2	—	5	12	—	—	—	2	1	3	4	7	15	21
9	—	3	4	6	8	—	2	—	6	20	—	—	1	—	—	—	5	5	12	28
10	—	5	5	6	9	—	3	2	3	16	—	—	1	—	—	—	8	8	9	25
11	1	6	4	4	9	1	2	6	7	9	—	—	—	1	—	2	8	10	12	18
12	—	2	4	8	4	—	1	2	6	23	—	—	—	—	—	—	3	6	14	27
13	1	3	3	3	8	1	2	5	3	21	—	—	—	—	—	2	5	8	6	19
14	—	—	9	6	8	—	2	5	2	18	—	—	—	—	—	—	2	14	8	26
15	—	2	9	5	8	2	4	3	6	11	—	—	—	—	—	2	6	12	11	19
16	—	4	5	9	8	2	5	6	2	8	—	—	—	1	—	2	9	11	12	16
Totals	6	40	73	92	102	48	63	76	68	170	—	—	3	6	3	54	103	152	166	275
	PER CENT OF ALL REPRESENTATIONAL					PER CENT OF ALL NONREPRESENTATIONAL														
	2	13	23	29	32	12	15	17	16	39										

* All figures doubled at 2 years of age.

Table 29

COMPACTNESS OF DESIGN, BOYS, NUMBER OF DESIGNS AT EACH LEVEL OF COMPACTNESS

	Representational					*Nonrepresentational*					*Mixed*					*All*				
Age in Years	*I*	*II*	*III*	*IV*	*V*	*I*	*II*	*III*	*IV*	*V*	*I*	*II*	*III*	*IV*	*V*	*I*	*II*	*III*	*IV*	*V*
2*	—	—	—	—	—	18	16	8	6	2	—	—	—	—	—	18	16	8	6	2
3	4	3	2	6	1	9	5	9	7	4	—	—	—	—	—	13	8	11	13	5
4	1	6	5	4	7	3	3	5	9	7	—	—	—	—	—	4	9	10	13	14
5	1	3	4	14	12	—	—	2	3	11	—	—	—	—	—	1	3	6	17	23
6	1	4	7	7	18	—	1	1	5	6	—	—	—	—	—	1	5	8	12	24
7	1	2	12	11	9	1	1	2	2	6	—	—	2	1	—	2	3	16	14	15
8	—	1	8	12	13	1	1	2	1	11	—	—	—	—	—	1	2	10	13	24
9	—	1	7	10	16	—	1	1	4	10	—	—	—	—	—	—	2	8	14	26
10	—	1	2	7	22	—	2	4	4	8	—	—	—	—	—	—	3	6	11	30
11	—	2	2	10	19	—	2	2	3	10	—	—	—	—	—	—	4	4	13	29
12	—	2	1	9	17	—	1	1	4	15	—	—	—	—	—	—	3	2	13	32
13	—	1	5	7	16	—	5	—	—	16	—	—	—	—	—	—	6	5	7	32
14	1	2	6	8	9	1	—	—	6	17	—	—	—	—	—	2	2	6	14	26
15	—	—	7	5	9	1	2	1	5	19	1	—	—	—	—	1	3	8	10	28
16	1	—	4	6	11	1	—	1	11	15	—	—	—	—	—	2	—	5	17	26
Totals	10	28	72	116	179	35	40	39	70	157	1		2	1		45	69	113	187	336
	PER CENT OF ALL REPRESENTATIONAL					PER CENT OF ALL NONREPRESENTATIONAL														
	2	6	17	29	43	10	12	11	19	46										

* All figures doubled at 2 years of age.

The main difficulty of assessment arises when several different figures are included in the same product, as in representational scenes or in separate designs. Where the individual forms themselves are spaced, no problem is presented; the total design may be classified as spaced. Similarly, where mixed spaced and compact forms are included, an intermediate rating may be given. Where the individual forms are entirely compact, the total design is usually rated as compact. When the forms themselves are spaced apart, however, a spaced effect is given to the whole, even though the individual figures are compact. Where the over-all impression of the figure is a spaced one, despite the fact that the individual forms are compact, a rating as low as Level III may be given. This effect usually occurs when the individual forms are quite small, where pairs of pieces are spaced over the tray. Compact forms of somewhat larger size may give a compact-intermediate over-all impression and may be so scored.

Tables 28 and 29 classify all designs made by subjects in the present study, girls and boys separately, for representational, nonrepresentational, and mixed designs.

Analysis of these tables yields the following conclusions as to age and sex differences. As far as both representational and nonrepresentational designs are concerned, boys' designs tend to be more compact than do those of girls. Although there are exceptions, the tendency is for designs, in general, to become more compact with increased age of the subject. For girls, all types of design being considered together, there is a slight decrease in compactness at 7, 11, 15, and 16 years; for boys, a slight decrease at 7 years.

SUCCESS OR LACK OF SUCCESS IN CENTRAL DESIGNS

Following Lowenfeld, we have classified central designs as successful or unsuccessful with regard to both color and form. Thus a design may be completely unsuccessful, successful in color or form only, or successful in both.

As Table 30 shows, the shift to predominantly successful in both respects comes in girls at 7 years of age. Although a substantial number of designs are unsuccessful in both respects through 11 years, most designs are successful in both respects or at least in form. Though there is a slight lapse in accuracy at 13 years, from 12 years on, by far the majority of designs are successful in both form and color.

Boys are slightly slower than are girls to achieve accuracy. Although, from 8 years on, it is the exceptional boy who makes a design which is completely unsuccessful, it is 9 years and following before the large majority are completely successful.

As the table shows, it is very unusual, in this group of subjects, for color alone to be accurate.

At 15 and 16 years, particularly at 15, several apparently successful patterns are asymmetric, but this appears to have been the intention of the makers.

Table 30

SUCCESS OR LACK OF SUCCESS IN CENTRAL DESIGNS

Age in Years	*4*		*5*		*6*		*7*		*8*		*9*		*10*		*11*		*12*		*13*		*14*		*15*		*16*	
	G	*B*	*G*	*B*	*G*	*B*	*G*	*B*	*G*	*B*	*G*	*B*	*G*	*B*	*G*	*B*	*G*	*B*	*G*	*B*	*G*	*B*	*G*	*B*	*G*	*B*
Neither color nor form accurate	11	4	8	4	7	2	4	2	2	1	3	1	2	1	2	1	2	0	7	1	0	3	1	5	2	4
Color, only, accurate	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1
Form, only, accurate	0	1	0	2	2	0	0	0	2	1	4	0	2	0	2	1	1	0	3	1	4	4	0	3	0	1
Both accurate	0	1	1	0	2	1	6	1	5	2	6	4	5	4	5	4	14	12	9	14	15	13	17	15	13	19
Total	11	6	9	6	11	3	10	3	9	4	13	5	9	5	9	6	17	12	19	17	19	20	18	23	15	25

Part Three

DEVELOPMENTAL CHANGES

CHAPTER 9

Two Years

	G	*B*	*All*		*G*	*B*	*All*		*G*	*B*	*All*
A. Nonrepresentational without pattern				B. Nonrepresentational with pattern				C. Representational	0	0	0
1. Just drop or pile	22	16	38	1. Fundamental	0	0	0				
2. Scatter singly	24	30	54	2. Central design	0	0	0				
3. Prefundamental	4	2	6	3. Design along rim	0	2	2				
4. Slab	0	0	0								
5. Over-all	0	0	0								
All A	50	48	98*	All B	0	2	2	All C	0	0	0

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* All figures are doubled at 2 years, since only 25 subjects of each sex were available.

QUANTITATIVE

GIRLS

Type of design. The leading type of design (at this age and at 3 years only) is nonrepresentational without pattern. All girls' records are at this level.

Form. Among nonrepresentational products, nearly all (44) are at form level I. There are no representational figures at this age.

As to the shapes used most, the large triangle leads (32 per cent of all pieces used); the small triangle comes second (24.5 per cent).

Color. Color use in nonrepresentational designs is at level I—no evident color pattern—with 38 girls at this level. As to the colors used most, blue is in first place (24 per cent of all pieces) and black is second (22 per cent).

Naming. The largest number (32) are now at level I—unnamed—but 18 girls reach level IV—pieces scattered, whole product named. As to the actual things named, the largest number of products (4) are called design; 2 each make house, other building, boat, merry-go-round, and part of house.

Compactness. Nearly even numbers are at levels I, II, and III.

Number of pieces. The mean number of pieces used by girls is 26.32; the median is 20.00.

Timing. The time spent is, at this age, shorter than at any following age. The mean time is 4:22 minutes, the median 4:30.

BOYS

Type of design. The leading type of design (at this age and at 3 years only) is nonrepresentational without pattern. Of the boys, 48 are at this level. The leading subclass is scattered singly (30).

Form. Among nonrepresentational products, nearly all (46) are at level I. There are no representational figures at this age. As to the shapes used most, the large triangle leads (33 per cent of all pieces used); the small triangle comes second (31 per cent).

Color. Color use (nonrepresentational figures) is at level I—no evident color pattern—with 42 boys at this level. As to the colors used most, black leads (25 per cent of all pieces used), and blue comes second (22 per cent).

Naming. The majority (32) are at level I—unnamed, but 16 do reach level IV—pieces scattered, product named. As to the actual things named, the largest number (6) name boat; 4 name houses; 2 each name decoration or star, animal, and car or train.

Compactness. Nearly even numbers are at levels I and II.

Number of pieces. The mean number of pieces used is 27.16; the median number is 23.00.

Timing. The mean timing of 2-year-old boys is shorter than at any subsequent age—5:21 minutes. The median is the same as at 3 to 5 years—5:00 minutes.

QUALITATIVE

GIRLS

The response of 2-year-old girls is extremely primitive, being still at a manipulative level. The least mature (22) simply grab handfuls of pieces and dump them onto the board. The level of performance is thus largely manipulative. This may result, if the subject is not restrained in any way, in the use of all different colors and all different shapes. It may also, if she dumps a handful at a time, result in a massing of colors which may produce a pattern that looks more planful than the mere motor manipulation appears to be, as observed in process.

In many instances however, either the child is somewhat restrained or she loses interest. Therefore the large triangles and the small triangles are used most, since they are nearest the child's hand as she grabs at the box. Also the blue being used most by girls (and next most by boys) probably results from its close location in the box. The strong use of black, however, must be considered selective, as it does not come nearest to hand.

Of the girls, 24 scatter pieces singly. Only 4 respond above the level of "scatter singly." These 4 make what we term "prefundamentals"; that is, they combine some 2 pieces. In some, these pieces are of the same color or shape, in some they are different, but this seems to occur more or less by chance.

Even at the simplest level, that of piling, there are degrees of excellence of performance. Extremely immature 2-year-olds pile whole handfuls (unless inhibited), resulting in a board filled with an untidy pile. Those slightly more mature make smaller, neater piles.

Those who scatter pieces singly often make a product which looks better than it is. Thus the few pieces scattered may fall by chance into what may slightly resemble some sort of pattern.

More advanced Twos pile or scatter pieces close to some one edge of the board. Superiority shows itself clearly in the few who do better than pile or scatter. Naming tends to be ahead of placement. Though 32 girls do not name, 18 of those who scatter single pieces name either the whole product or some of the single pieces. Thus they may name such things as design, house, merry-go-round, and boat.

BOYS

The performance of boys is very similar to that of girls in that nearly all are merely at the levels of dropping or piling or of scattering singly. Boys are slightly ahead of girls in that only 16 merely drop or pile and 30 scatter singly. As with girls, 4 have some slight pattern; 2 extremely superior boys place pieces near the edge, 2 others make prefundamentals.

The boys' products are, on the whole, slightly better than those of girls, but naming is about the same in the two sexes. Among the boys, 32 do not name, 16 name the whole product, and 2 name single pieces as they scatter them. Boys name house, animal, train, and boat.

DEVELOPMENTAL TABLE

BELOW AGE

Refusal or inability to respond at all to the test situation

AT AGE

* Dropping or piling pieces by the handful
* Scattering single pieces

ABOVE AGE

Making prefundamentals
Any pattern beyond the making of prefundamentals is scored at 3 years of age or better

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* Most highly characteristic items.

SEX DIFFERENCES

Type of design. Both girls and boys make chiefly nonrepresentational designs without pattern. Scattering pieces singly is the leading subclass for both. Boys, however, are just a trifle advanced in type of design: 22 girls simply drop or pile pieces, but only 16 boys do this. Only 24 girls scatter singly, as compared to 30 boys. A design along the rim is made by 2 boys but no girls.

Form. Nonrepresentational patterns are nearly all at level I. There are virtually no representational patterns. As to the specific shapes used, both sexes use the large triangle most, the small triangle next.

Color. Both are chiefly at level I—no color pattern—though a few more girls than boys do go beyond that level. Girls use blue most; boys use black most.

Naming. Naming is about the same for the two sexes. The majority are at level I, though a few do reach level IV. Girls name design most; boys name boat more often.

Compactness. Girls' products are a little more compact.

Number of pieces. Girls use fewer pieces than do boys.

Timing. Girls work for a shorter period of time, on the average, than do boys.

Symmetry. There is no noticeable symmetry either in construction of specific figures or in placement of pieces on the paper.

For all of these minor differences, the responses of the two sexes are very similar. Neither boys nor girls, for the most part, appear ready to respond effectively to the Mosaic test. Rather, they chiefly pick up single pieces and scatter them on the board.

ACCOMPANYING OR CHARACTERISTIC BEHAVIOR INCLUDING VERBALIZATION

The Mosaic is not, for most subjects, a too-useful test for revealing individuality at this age. It appears to tell us a good deal, however, about the child's level of development. The average 2-year-old can manipulate the pieces in a productive, meaningful manner, and there is considerable individual variation between those children who merely scatter and those who neatly place the pieces.

Many subjects find it difficult to attend to the examiner's demonstration and to wait until it is completed. Others simply are not interested. Some just mess up the pieces in the box, without taking them out. Others take the pieces out and then return them to the box, not actually making anything on the paper. Many just pick up pieces and then scatter or place them at random, drop them in a pile onto the paper, or drop them one by one to make rather a pile on the paper. Some simply manipulate the pieces, trying to stand them up or scratching the paper with the point of a piece. Pieces are likely to become a little damp because of the thumb or finger sucking which goes on while the child is responding.

The most advanced subjects take out only a few pieces and place them singly on the paper. Of these, the extremely advanced name the individual pieces: "Dere's a sailboat. Anudder sailboat. Anudder sailboat." Also, some of those who merely scatter pieces at random or pile them at random do give a name to their product.

ILLUSTRATIONS

(SEE PLATE 1)

Girls:
- a) Scattered single pieces
- b) Scattered and piled
- c) Scattered or placed at random, occasionally pieces touching or forming prefundamental pattern

Boys:
- d) Scattered single pieces
- e) Scattered and piled
- f) Scattered or piled at random, occasional pieces touching

CHAPTER 10

Three Years

	G	B	All		G	B	All		G	B	All
A. Nonrepresentational without pattern				B. Nonrepresentational with pattern				C. Representational			
1. Just drop or pile	7	3	10	1. Fundamental	1	2	3	1. Object	7	10	17
2. Scatter singly	**18**	10	**28**	2. Central design	0	2	2	2. Scene	0	6	6
3. Prefundamental	6	**12**	18	3. Design along rim	4	3	7				
				4. Fills tray Frame-and-item design	6	1	7				
				5. Separate designs	1	1	2				
All A	31	25	56	All B	12	9	21	All C	7	16	23

QUANTITATIVE

GIRLS

Type of design. Nonrepresentational figures without pattern lead (31 girls), with scatter singly (18) the main subclass.

Form. Among nonrepresentationl patterns, level I still leads (26 girls). Form is not classified for representational products. As to the actual shapes used, girls use large triangles most (31 per cent of all pieces used) and small triangles second (29 per cent).

Color. There is no evident color pattern (level I of use of color) in most (33) girls for nonrepresentational patterns. Level I also predominates in representational figures. Blue is the leading color used (21 per cent of all pieces used) and black comes second (18 per cent).

Naming. The largest number of products at this age (17) are classed at Level I—unnamed. The second largest number (11) are at level IV—pieces scattered, whole product named. As to the specific things named, the largest number (7) name house; next comes tree (3); 2 make car or train and 2 make building other than house.

Compactness. The largest number (18) are at level II of compactness.

Number of pieces. More pieces are used, on the average, at 3 years than at 2. The mean increases from 26.32 to 28.42; the median from 20 to 24.5.

Timing. Girls take longer to complete products at 3 than at 2 years. The mean increases from 4:22 minutes to 6:31 minutes; the median from 4:30 to 5:00.

BOYS

Type of design. Nonrepresentational designs without pattern lead (25), with prefundamental the leading subclass (12), and 10 boys scatter singly. In second place come representational designs (16).

Form. Among nonrepresentational patterns, levels I and II lead with 13 and 18 boys, respectively. Form is not classified for representational patterns. As to the actual shapes used, boys use the large triangle first (40 per cent of all pieces used); the small triangle second (17 per cent).

Color. The largest number of nonrepresentational designs (19) are at level I—no evident color pattern; the second largest number (13) are at level IIb—partial use of color consistent with form. Level I also leads for representational figures (12 boys). Blue is the leading color used (27 per cent) and black comes second (19 per cent).

Naming. The largest number of products at this age (23) are at level I—unnamed. The second largest number, however, are at level V—several pieces grouped together, though inaccurately, and named. As to the specific things named, the largest number name scene (5); next come car or train (4), house (4), and design (4); 3 make merry-go-rounds or windmills.

Compactness. The largest number at this age are at levels I and IV (13 each).

Number of pieces: Fewer pieces are used than at 2 years. The mean decreases from 27.16 to 26.59; the median from 23 to 20.

Timing. Boys take longer to complete products than at 2 years. The mean increases from 5:21 to 6:34 minutes; the median stays the same—5:00 minutes.

QUALITATIVE

GIRLS

Three is clearly a transitional age between 2 years, when all girls make nonrepresentational designs with no pattern, nearly all merely dropping or piling or, at best, scattering pieces singly, and 4 years, when only 4 subjects fall in this class.

At 3 the majority (31) still make nonrepresentational designs without pattern, but only 7 just drop or pile, 18 still scatter singly, and 6 make prefundamentals. Other conspicuous patterns at this age are 4 designs along the edge, 6 frame-and-item designs, and 7 objects.

Thus dropping or piling pieces has fallen off from 22 to 7, placing singly has dropped from 24 to 18, and all nonrepresentational designs without pattern have decreased from 50 to 31. Nonrepresentational designs *with* pattern have increased from 0 to 12; objects from 0 to 7.

As at 2 years, with those who merely drop or pile, we note again bunches of color. Again, the product may appear to be more selective than the process would warrant, since many either take up handfuls of pieces or take pieces up one by one and then put them down on the board. The arrangement in the box results in several of one color being chosen in series. Thus the product may consist of a small clump or line of pieces of one color, and then another clump or line of another color. The majority, however, even then tend to have some extra piece or pieces along with their clusters.

Only 17 now do not name, 33 naming at one level or another.

Classification here is a little difficult, as many subjects now name either single pieces or groups of pieces which do not actually resemble anything. Single pieces dropped, piled, or scattered, even when named, are not classed as objects or designs, but when several pieces are combined and named they are classed as they are named. Thus 3 or 4 pieces grouped together and named "house" are classed as object, even though they may not look like a house.

Frame-and-item designs at this age are usually just a frame and some *pieces* inside the frame. The placement of a few pieces in each corner seems more advanced than a continuous frame. In order of increasing maturity we find:

Pieces lined up, but not in relation to the edge
Partial frame on one side
Frame on one side
Frame on two, three, and four sides
Frame and center
Corners only
Little areas, neat and compact, and named

Squares placed in an angular line and point to point occur in the more superior subjects at this age, suggesting an awareness of the oblique.

There is little color matching, though a few do seem to make a real effort to match beyond that which occurs simply because a child takes a bunch of pieces of one color from the box and drops or places them on the paper.

BOYS

There is a marked change and improvement since age 2. The category drop or pile has decreased from 16 to 2, and scatter singly is down from 30 to 10. In both of these classifications we find a conspicuous grouping of pieces of the same color. All nonrepresentational designs without pattern are down from 48 to 25. Nonrepresentational designs with pattern have increased from 2 to 9, representational objects from 0 to 10, and scenes from 0 to 6.

There is much more naming here than at 2 years. Although 23 boys still give no name to their product, 10 group several pieces (though inaccurately) and name them, and all others name at some level.

As with girls, classification is difficult, as many of the "objects" named do not resemble objects. Outstanding responses are scattering singly, with or without naming, (10); prefundamental (12); object (10); scene (6).

Boys are somewhat advanced over girls in the types of designs made.

DEVELOPMENTAL TABLE

BELOW AGE

Just drop or pile

AT AGE

- * Scatter singly, with or without naming
- * Prefundamentals
- * Any nonrepresentational designs *with* pattern
    - Pieces lined up but not in relation to edge
    - Partial frame on one side
    - Frame on one side
    - Frame on more than one side
    - Frame and center
    - Corners only
- * Object named, though not necessarily resembling thing named
- Scenes, though usually not resembling thing named

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* Most highly characteristic items.

SEX DIFFERENCES

Type of design. For both girls and boys, nonrepresentational designs without pattern lead, though there are more of them (31) in girls than in boys (25). More girls than boys (12/9)* make nonrepresentational designs with pattern, but more boys than girls make representational designs (7/16), and only boys make scenes.

Form. Boys are a little ahead of girls, most girls being still at level I and boys being about equally at levels I and II. Both use the large triangle most; the small triangle comes next.

Color. Boys are a little more advanced for nonrepresentational figures. For representational figures both are at level I—no patterned use of color. Blue is the color used most by both, and black comes second.

Naming. The majority of products of both boys and girls are at level I. More boys than girls fail to name (17/23). More girls scatter and name the whole thing (11/1). More boys group pieces and name (3/7). Thus boys seem a little more advanced in the type of structures named.

Compactness. Boys' products are more compact than the girls'.

---

* Figure for girls is always given first.

Number of pieces. Girls use more, boys fewer, pieces than at 2 years. Girls use more pieces than do boys.

Timing. Both take longer than at 2 years, but the timing is identical for boys and girls.

Symmetry. No noteworthy symmetry of product or placement is observed in either sex.

Sex differences at this age are small and not striking, but, in general, the products of boys do seem to be slightly more advanced than are those of girls in the type of design and use of color. Girls' products are of slightly better form, and girls use more pieces than do boys.

ACCOMPANYING OR CHARACTERISTIC BEHAVIOR INCLUDING VERBALIZATION

Many children still find it hard to wait for, or to attend to, demonstration. Some still use the pieces merely at a manipulative level; they pile them, write with them, handle the pieces in handfuls. Some, however, place pieces singly, and some make simple combinations. The total response seems, in some, more like that of an older child. The initial tendency to grab can sometimes be restrained.

In some at this age there seems to be selection not only by color but by shape. Some also use pieces in an advanced manner, lining them up, for instance, and calling them choo-choo train. A few superior and highly verbal children at 3, and even more at 3½, verbalize in a lively and interesting manner, telling the examiner what they are building. Such verbalization is usually considerably ahead of actual manipulative ability. The typescript on one superior 3½-year-old reads as follows:

> Subject verbalizes "I don't know." Sighs. "Can I make that?" He points to a painting on the wall. "How do you make it?" He takes a large blue triangle. "Where this one go? Here?" He places it on the paper and picks up a large red triangle and asks where that goes. Takes another large blue triangle, "Where this go? Where this go?"
>
> Takes a black scalene. "Now two. Now I'm makin' eyes." Places black square. "I like this color. This may be a nose." Blue scalene. Takes a black scalene but then wants it put back into the box as he does not need it. Asks for another black square, and that is the other eye. Is making an open face.
>
> Blue triangle is a "mouf." "Big nose"—adds another black scalene. Then what started out to be the *eyes* turn into *stars,* the "mouf" becomes a *moon,* and the other piece is used as sun. "Moon going down and moon going up."
>
> Black large triangle. "Sun. No night! That's the day," he says, indicating blue triangle. Yellow triangle is a *mountain.* Black triangle is the "sea." Blue is another mountain. "That's over to Cambridge" (England) "Where Martin is. Martin is one of our friends. He's grown up. I *think!*"
>
> "Keep this like this and call my mummy to see it. . . . A bumper for the sun," he says, adding another piece to the sun. White triangle. "House. Malting house." (His former home.) "That's daddy's study. Daddy has a point." (The top of white triangle.) Adds red triangle. "That's going to go right here." He is encouraged to stop.

Some 3-year-olds finish almost immediately and refuse to go on. Others keep adding single pieces to their total product until they are stopped, either when the paper is covered or at the end of 20 minutes. Such children give the impression that they might continue, if permitted, until all pieces in the box had been transferred to the paper. Some ask many questions about which pieces to use or where to put them, such questions suggesting better constructive ability than is actually present. Some seem to be more interested in conversation with the examiner than in manipulating the pieces.

ILLUSTRATIONS

(SEE PLATE 2)

Girls:
a) Scattered or placed, single pieces
b) Prefundamental, edge placement, minimal lining up in midst of scattered or singly placed pieces
c) Pieces placed and grouped singly or lined up; named: house, chimney

Boys:
d) Pieces scattered singly and named: cars
e) Prefundamental, grouping and edge placement
f) Edge placement, grouping; objects: choo-choo train, airplanes

CHAPTER 11

Four Years

	G	B	All
A. Nonrepresentational without pattern			
1. Just drop or pile	1	2	3
2. Scatter singly	5	6	11
3. Prefundamental	7	4	11
4. Slab			
Small	1	2	2
Large			
5. Over-all			
All A	14	14	28

	G	B	All
B. Nonrepresentational with pattern			
1. Fundamental	3	4	7
2. Central design	11	6	17
3. Design along rim	1	2	2
4. Fills tray			
Frame-and-item design	0	1	1
Whole pattern	1	0	1
5. Separate designs			
All B	16	13	28

	G	B	All
C. Representational			
1. Object	18	20	38
2. Scene	0	3	3
All C	18	23	41
D. Mixed, representational and nonrepresentational	2	0	2

QUANTITATIVE

GIRLS

Type of design. Leading is representational design (18 girls). Among these, object (18) is the leading subclass. Nonrepresentational designs with pattern were made by 16 girls.

Form. Among nonrepresentational patterns, level III (12 girls) leads. Among representational patterns, form is too vague to be classified. As to the actual shapes used, the large triangle leads (27 per cent of all pieces used), with scalenes second (23 per cent of all pieces).

Color. The level of color use for both nonrepresentational and representational designs is level I—no evident color pattern, with 20 (nonrepresentational) and 10 (representational) still at this level. As to the actual colors used, blue leads (24 per cent of all pieces used). Red comes second, with 17 per cent of all pieces. As to color combinations, only 8 girls use only three or fewer colors.

Naming. The outstanding level of naming is level I—unnamed, with 16 girls at this level. As to the actual things named, house leads (8 girls), design comes next (7), and then comes merry-go-round or windmill (3).

Compactness. The largest number of girls' products (12) are at level IV of compactness.

Number of pieces. Girls at 4 use fewer pieces than at 3. The mean drops from 28.42 pieces to 26.72; the median from 24.50 to 20.00.

Timing. The products now take longer to complete than at 3 years. The mean increases from 6:31 to 7:56 minutes; the median from 5:00 to 6:00.

Symmetry. The products at this age are too scattered and irregular to make analysis for symmetry practical.

BOYS

Type of design. Representational designs lead here (23 boys), with object (20) the leading subclass.

Form. Among nonrepresentational patterns, levels I and III tie for first place. Representational patterns are too scattered to be classified. As to the specific shapes used most, larger triangles lead (34 per cent of all pieces used), and small triangles come second (24 per cent).

Color. The level of color is level I—no evident color pattern—with 13 boys. For representational patterns, 11 boys (the largest number), are at level IIb—partial use of color consistent with form. As to the actual colors used, blue leads (29 per cent of all pieces used), and green and black come second (16 per cent each). As to color combinations, 12 boys use only three or fewer colors. There are 2 who use all blue; 3 who use red, white, blue, and black.

Naming. The outstanding level of naming is level I—unnamed—with 21 boys at this level. As to the things named, house and boat lead (5 each), then building other than house (3), and merry-go-round or windmill (3).

Compactness. The largest number of products (14) are at level V of compactness.

Number of pieces. Fewer pieces are used here than at 3 years. The mean drops from 26.59 to 24.42; the median from 20 to 16.

Timing. The products take somewhat longer to complete than at 3 years. The mean rises from 6:34 minutes per child to 7:13; the median remains at 5:00 minutes.

Symmetry. As with girls, the products of boys are too scattered and irregular to make analysis for symmetry practical.

QUALITATIVE

GIRLS

There is a tremendous variety of response here, but a great advance since 3 years of age. Merely dropping pieces onto the paper, or scattering pieces singly, which occurred in 25 of the girls at 3 years, now occurs in only 6. Only 7 still make prefundamentals. Among the numerous paired pieces, some match in form, some in color.

Including 1 small slab, only 14 girls now make nonrepresentational designs without pattern. Now 16 girls make nonrepresentational designs with pattern, and 18 make objects. In the majority there is considerable selectivity as to the pieces which are put down together. Little clumps or clusters consist often of pieces all the same shape or all the same color. The extra pieces which "spoiled" earlier clumps are now often absent.

The best example of this is the basic 4-year-old circle made of 6 large triangles, all the same size and often all the same color. The total page may not be a good form with color repeating form, but there may be islands of correct color and form. Even when not totally accurate, most clumps of pieces are rather neat and somewhat planned. These separate clumps of pieces may be mere pairs or prefundamentals, but, as noted, 16 girls do make nonrepresentational designs with pattern.

Conspicuous are 7 vertical lines of triangles and 5 vertical lines of squares. There are 5 basic circles, each made of 6 large triangles, either alone or as parts of objects or designs. Many patterns are named object and so classed, although they do not resemble the thing named. Small 2-piece houses are made by 4 girls, and several of the more superior make small but nicely spaced designs.

Large triangles are the leading form used. Blue is the leading color, with red second, although many use all colors. There are fewer pieces used than at 3 years. Instead of covering every bit of the paper, the products now are drawing away from the edge, unless the edge is treated in an effort at an actual border or frame.

Note the kaleidoscopic nature of some 4-year-old products. It is as though the pieces had almost fallen into place. Also, though many Threes are too immature, many Fours give, in their 4-year-old product, a preview of what their product may become at a later age. Already by 4 years, a careful reading of the Mosaic can give clues as to basic individuality.

BOYS

There is a conspicuous advance here over 3 years, in that dropping and scattering of pieces has decreased from 12 to 8; prefundamentals have decreased from 12 to 4, and all nonrepresentational designs without pattern have fallen from 25 to 14. Conversely, central designs have increased from 2 to 6, all patterned nonrepresentational designs from 9 to 13, and objects from 10 to 20. There are even 3 scenes (not found in girls).

Evaluation of the products at this age is made difficult by the fact that many products which are named objects (and which we have classed as objects) are really fundamentals or mere clusters of pieces.

As with girls, there are numerous small spaced designs. There are 3 fundamental circles of 6 triangles each (which we consider outstandingly characteristic of Fours), 4 such circles included in more elaborate designs, and 4 which are almost complete, making 11 in all. In several, these basic circles interlock.

There are 8 lines of squares, some of which are interlocking; 2 lines of triangles; and 2 of diamonds. Small 2-part houses are made by 3 boys. Blue is the leading color used, green the second. The large triangle is the most popular shape.

DEVELOPMENTAL TABLE

BELOW AGE

Just drop or pile
Scatter singly

AT AGE

* Prefundamentals
* Fundamentals, especially basic circle of 6 large triangles
* Rows of squares, diamonds, or triangles—vertical or horizontal
* Small central design or designs
Fills tray
    Frame-and-item design
    Whole pattern
Edge design
Small 2-piece houses of square and small triangle
* Representative objects named, either resembling or not resembling thing named

---

* Most highly characteristic items.

SEX DIFFERENCES

Type of design. Both girls and boys make chiefly representational designs, objects leading (18/20). Girls make more central designs (11/6). The products of both sexes, however, are divided rather evenly among nonrepresentational without and with pattern, and representational designs.

Form. Girls' form is a little more advanced than that of boys. Both use the large triangle most. Girls use scalenes second; boys, small triangles.

Color. Both are still at level I—color not used in a patterned manner. For representational objects, boys' use of color is slightly ahead of girls'. Blue is the leading color for both. Red comes second for girls; black and green for boys.

Naming. Boys have more unnamed products than do girls (16/21). Boys, however, *seem* advanced in type of structure made and named, since girls have 7 with pieces scattered and named, boys only 3. Girls have only 5 with pieces grouped, though inaccurately, and named; boys have 11.

This impression of boys being ahead is false, however, because boys scatter just as many pieces as girls do, merely naming fewer of those scattered. Of those grouped and slightly resembling the object named, the sexes are about even. Girls are actually ahead, with 7 objects resembling object and named; boys with only 4. Also girls have 5 designs resembling design and named; boys have only 1. Thus girls are more mature in having more objects and scenes which look like the thing named.

Compactness. Boys' products are slightly more compact than are girls'.

Number of pieces. Both use fewer pieces than at 3 years. Girls use more than do boys.

Timing. Both take somewhat longer than at 3 years. Girls take a little longer than do boys.

Symmetry. There is no appreciable symmetry of product or placement.

ACCOMPANYING OR CHARACTERISTIC BEHAVIOR INCLUDING VERBALIZATION

Four-year-olds tend to joke and to behave in a silly manner. They talk to the pieces: "Where are you going?" They make remarks—"Upsidee!" or "I'm gonna put water on your head," etc.—to the examiner. Most exhibit great enthusiasm, energy, and speed and are likely to dismantle their structure, either by accident or on purpose. Placement is still often not particularly careful, although it is in marked contrast to 3 years.

Conversation either about what they are making or about outside matters is, in some, almost continuous. Most are extremely friendly and conversational with the examiner: "Dere. Dis goes here. Dis goes dere. Isn't dis a funny windmill?" or "Now let's see. I think I'll take white"; or "Black is what I would like. That's too big, too. It won't stand up. I think I'll lay it down. Now I think. . . . That's the way that one's going to go. Now I'm going to make a airplane that's going to go and bust it right down." (The child starts to tear the whole thing down but is restrained.)

Talk may exceed building: "A little yard. That really is a little yard. Only one child could play there and there's not much room to wheel a baby carriage"; or, "That's a nice one. A flower on top of a stem. I made that crossing so it would stand up. [Makes a second flower.] Other is the mother flower. Looks like a tree only trees aren't blue like that. . . . Those are flowers all around the garden. And I have a big garden and they dug up some of them strawberries when they're all through and my mother and I are going to plant flowers where the strawberries were."

Some talk about home: "Mummy likes this skirt best. . . . My sister's birthday's in July too but she's not only half as old as me because she only got born last year."

Others talk more specifically about what they are building:

> I'm trying to make a house out of it if I can. . . . There that's one. . . . Now what do I need now? Let's see. That's the roof and we need the square pillars right there. Now I'll

> take another one and put it on this side. Now we have to take 'bout two more, put these two on the bottom of those two blue squares. Now we need two whites. Now we need a front door. Front door would like pretty yellow. Goes right there to be a door. Only two more. Now what do we need? That's the front of the house. Now what we need is green grass—take these. Guess we'll need all of the green, maybe.

Many talk quite a lot, though not always accurately, about the colors they are using.

For all their sometimes rather elaborate and specific verbalization, Fours seem to have an extremely *motor* notion of the whole situation. They grab pieces as the examiner demonstrates, find it hard to wait for the demonstration, and finger pieces in the box. In spite of this motor response, fine motor reactions often seem very poor. Getting pieces out of the box may be difficult for them: "Let's see if I can get out only one." Several children try to stand pieces on end or to spin them around. If and as they change their plan, many push earlier structures out of the way but leave the pieces on the board.

Some concern is expressed as to what they can and cannot make; about what there is or isn't room for: "I hope these won't be too much because it has to go all around here and it can't. I should' a made it here"; or "There won't be room. There has to be room." There is also some overlapping of pieces, probably due more to carelessness than to intention.

About one-third of our 4-year-olds cannot tell what they have made.

Some children at 4 inevitably have to interrupt their work to go to the bathroom.

ILLUSTRATIONS

(SEE PLATES 3, 4)

Girls:
- a) Prefundamental named: cupcake, clown
- b) Central design
- c) Central design
- d) Design
- e) Design filling tray
- f) Basic 4-year-old circle

Boys:
- a) Central design
- b) Objects: windmill, farmhouse
- c) Object: dredge furnace
- d) Object: airplane
- e) Object: train
- f) Scene: boat, sun, rock

CHAPTER 12

Five Years

	G	B	All		G	B	All		G	B	All
A. Nonrepresentational without pattern				B. Nonrepresentational with pattern				C. Representational			
2. Scatter singly	1	0	1	2. Central design	9	6	15	1. Object	22	29	51
4. Slab				3. Design along rim	1	3	4	2. Scene	3	5	8
Small	4	1	5	4. Fills tray				All C	25	34	59
Large	1	3	4	Frame-and-pattern design	3	0	3	D. Mixed, representational and nonrepresentational	2	0	2
5. Over-all	1	0	1	Whole pattern	0	1	1				
				5. Separate designs	3	2	5				
All A	7	4	11	All B	16	12	28				

QUANTITATIVE

GIRLS

Type of design. The leading type of design is representational (25 girls). Of these, the largest number (22) make objects. Next comes the patterned central design (9), and, next, slabs (5).

Form. Among nonrepresentational designs, the most fall at level III. Among representational designs, the majority (15) fall at level II. As to the actual shapes used, squares and large triangles tie for first place, each with 25 per cent of all pieces used.

Color. Among nonrepresentational products, the most popular level for the use of color is IIa—partial use of color, no relation to form (10 subjects), but 9 girls are still at level I—no evident color pattern.

Among representational products, the largest number of girls (11) are at level IIb—partial use of color consistent with form.

As to the actual colors used, the largest number (35 per cent of all pieces) are blue; second comes black (19 per cent of all pieces). As to combinations of colors, 13 girls use only three or fewer colors. Of these, 3 use only blue; 2 use red, white, and blue; 2 use red, blue, and black.

Naming. As to the manner of naming, object named object and design named design tie for first place (14 each). As to the actual things named, design leads (14), house comes next (11), and other building comes next (8). Scenes are named by 3, and 3 name merry-go-round and windmill.

Compactness. At this age, for the first time, the largest number of subjects (21) fall at level V.

Number of pieces. Girls use fewer pieces at 5 years than at 4. The mean drops from 26.72 to 21.22; the median from 20 to 14.

Timing. Timing is shorter than at 4 years of age. The mean drops from 7:56 minutes to 6:24; the median from 6 to 5 minutes.

Symmetry. Only 7 girls place their products symmetrically on the paper, and only 12 make symmetric products. These are lower than the figures for symmetry for any subsequent age.

BOYS

Type of design. The leading type of structure is representational (34). Of these, the largest number (29) make objects. Next come 6 central designs, and, next, 5 scenes.

Form. Among nonrepresentational designs, the most (6) fall at level III. Among representational designs, the majority (18) fall at level I. As to the actual shapes used, the largest number (34 per cent of all pieces used) are squares, and the next most (20 per cent) are large triangles.

Color. Among nonrepresentational designs, the largest number of boys (15) are at level IIb—partial use of color consistent with form. Among representational products, the largest number (12) are also at IIb.

As to the actual colors used, blue comes first (37 per cent of all pieces used), and red comes second (15 per cent). As to combinations of colors, 15 boys use only three or fewer colors. Of these, 1 uses all blue; 3 use blue and white only; 4 use green and 2 other colors.

Naming. As to the manner of naming, object named object clearly leads (19 boys). As to the actual things made, house leads (14), and airplane, rocket, and arrow come next (8). Animals are named by 5, and 4 each mention person, building other than house, decoration, or star.

Compactness. The largest number of subjects (23) fall at level V of compactness.

Number of pieces. Boys use more pieces at 5 than at 4 years of age. The mean rises from 24.42 to 28.40; the median from 16 to 20.50.

Timing. The products are built in a slightly shorter time than at 4 years. The mean drops from 7:13 to 6:47 minutes; the median remains at 5 minutes.

Symmetry. Only 6 boys place their products symmetrically on the paper, and only 4 make symmetric products. These figures are smaller than those for any subsequent age.

QUALITATIVE

GIRLS

The leading type of stucture is representational (25), with 22 of these being objects. These objects are almost equally divided between those in which the pieces are used as paint (7),* the use of 2 to 5 pieces combined cleverly and effectively in small patterns (6), and good large or complex objects which include large open square structures (7). Only 2 objects are below these levels.

In both designs and objects there are many in which pieces, especially squares, are lined up (9), in which the structure consists of a 4-year-old circle of triangles or an elaboration of this (4), or in which the subject makes a square structure consisting of at least 9 square pieces (2). There are at least 8 small 2-piece houses made of a square capped with a small triangle, often more than one on the paper.

Outstanding are at least 15 small, compact, patterned designs or slabs. There may be a single such design or object, or several separate ones, on the paper. In addition to pieces lined up, we find houses with chimney, smoke, and a steeple. Girls' designs, in general, seem to be more loose and open than are those of boys.

BOYS

The leading type of structure is representational (34), of which 29 are objects (mostly so named) and 5 are scenes. Objects are chiefly made from separate pieces used as paint (11) or are good large or complex structures, including large open square objects (10); 7 are made of 2 to 5 pieces cleverly combined to resemble the thing named.

In both design and object there are many in which squares or other shapes are lined up (10), in which the structure consists of a 4-year-old circle of triangles or an elaboration thereof (8), or in which the subject makes a square structure consisting of 9 squares or more (5). There are 2 small 2-piece houses.

Conspicuous, as with girls, are at least 12 small compact designs or objects made up of not more than 6 pieces each. As at 4 years of age, some structures which really resemble designs or fundamentals are named objects, and thus are so classified under type of structure. Several boys make a number of unrelated objects or designs.

An outstanding improvement since age 4 is that, for the most part, nonrepresentational designs without pattern are diminishing, and objects have increased markedly.

BOTH SEXES

Manipulation of pieces is becoming sophisticated enough so that many subjects have gone beyond the mere combining of shapes or colors which are alike. Now there is the beginning of experimentation with different types of combinations.

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* In fact, one 5-year-old in our sample actually verbalized, "I'm gonna paint with these."

Thus, in combining triangles, instead of putting the sides close together as at 4, the subjects place these pieces point to point. The same is true of diamonds, and, most conspicuously, of squares.

In some children it seems to be almost the *mechanism* of performance (that is, the process) which is of primary interest, rather than the product. Though the point-to-point relationship of pieces, first seen in a few superior Threes and Fours, is perhaps the primary thing being stressed, other kinds of combination and juxtapositions are being tried out. Thus, even when the result may simply be separate pieces near each other, they are often placed on the board in pairs. These two pieces may be of the same shape or of the same color.

This exploration and exploitation of different kinds of possible combinations (without too much interest in the product) may be the key to slabs which, except for 3 small slabs made at 4 years, occur here for the first time.

DEVELOPMENTAL TABLE

BELOW AGE

Single pieces
Prefundamentals
Two or three pieces together, named or unnamed but not resembling object and not good design
Basic 4-year-old circle, unembellished

AT AGE

Scenes
* Lines of squares, single or multiple
* Lines of triangles, diamonds or squares
* Small slabs, most pieces fit on at least one side
* Small central designs
Frame-and-item design
* Two-piece houses or better
* Elaboration of 4-year-old circle
Solid square of squares (9 or more)
* Any sort of man or house (except 3- to 4-year-old type; that is, one or several pieces in no way resembling man or house but so named)
* Objects made somewhat resembling object and named; that is, chips used like paint
* Large open square house or other object of squares
Elaboration or combinations of 4-year-old circles

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* Most highly characteristic items.

SEX DIFFERENCES

Type of design. The most of each sex make representational designs, although more boys than girls do this.

Form. The largest number of subjects of both sexes make nonrepresentational products at level III. For representational objects, girls construct predominantly at level II, but boys do so only at level I. As to the shapes used most, for girls, squares and large triangles tie for first place; squares come first for boys, with large triangles second.

Color. Boys are much more advanced than girls in the use of color for nonrepresentational products. As to representational designs, the sexes are about even. Girls use blue most, then black; boys use blue most, then red.

Naming. In girls, object and design lead. In boys, object leads.

Compactness. Boys' products are very slightly more compact than are girls.

Number of pieces. Girls use fewer pieces at 5 than at 4 years, but boys use more than at 4. Boys use considerably more than do girls.

Timing. The timing for the two sexes is almost identical.

Symmetry. Girls' products are slightly more symmetric than are those of boys, both as to placement on the paper and as to the actual product.

ACCOMPANYING OR CHARACTERISTIC BEHAVIOR INCLUDING VERBALIZATION

Five-year-olds are less silly and are quieter and less talkative than 4-year-olds. Their response is much more workmanlike than at 4. They are likely to make something which is more or less meaningful to them and is reasonably neat and contained. They build in a businesslike, neat way. The average timing is considerably shorter than at 4 years. The subjects are less likely to have to be stopped at the end of 20 minutes; in fact, most fall far short of this deadline.

Some seem quite self-assured and self-contained: "You mean copy these? I know how." Most are agreeable, compliant, and cooperative. Their approach is thoughtful and efficient: "What shall I make? Let me think." Those who stop and think for a while before starting present a marked contrast to the younger ages when children start in at once, hardly even waiting for the demonstration.

Several announce quite early what they have decided to make. Several are quite companionable with the examiner: "What do *you* think I should make?" Or they chattily make such comments as, "Guess I have to take all the blacks and put the greens back." Some talk almost constantly about what they are making.

Most are matter of fact. One child jars a piece but says, "It doesn't matter." Even though the final product may not be too good form, most seem quite certain about what they have made and are pleased with it. Many still try to stand pieces up, and some (especially boys) actually succeed. With boys especially, there is considerable piling, overlapping, and standing on end.

Most Fives build quite systematically and rather planfully. Some speak, as they build, in a rather mature manner: "What a predicament!" or "This is going to look like a big structure of a tent." Many work busily, cheerfully, and seem to know when they are finished, though often, to the examiner, one stopping place would seem as good as another.

Houses are a very popular form at this age, and squares are a preferred shape with many. Quite a number start with a square and then add a blue diamond. Some at 5, as at 4, have to interrupt their work to go to the bathroom.

ILLUSTRATIONS

(SEE PLATE 5)

Girls: a) Central design named design
  b) Object: girl
  c) Scene: house, sidewalk, tower, etc.

Boys: d) Design and object: kite
  e) Object: Christmas tree
  f) Object: house

CHAPTER 13

Six Years

	G	B	All		G	B	All		G	B	All
A. Nonrepresentational without pattern				B. Nonrepresentational with pattern				C. Representational			
3. Slab				2. Central design	10	3	13	1. Object	23	24	47
Small	1	0	1	3. Design along rim	0	2	2	2. Scene	9	13	22
Large	1	3	4	4. Fills tray Frame-and-item design	1	1	2	All C	32	37	69
4. Over-all	0	2	2	5. Separate designs	5	2	7	D. Mixed, representational and nonrepresentational	0	0	0
All A	2	5	7	All B	16	8	24				

QUANTITATIVE

GIRLS

Type of design. By far the outstanding type of design is representational (32 girls), with 23 of these representational designs being objects and 9 being scenes. Next come central designs (10) and separate designs (5).

Form. The largest number of girls' nonrepresentational products (7) fall at form level V, though for the first time a substantial number (5) reach level VI. For representational figures, the majority (13) are at level II. As to the specific shapes used, the most (28.3 per cent of all pieces used) are squares; the second largest number (26.3 per cent) are large triangles.

Color. For nonrepresentational products, the most prominent level of color use is IIb—partial use of color consistent with form. The products of 7 girls fall at this level, although 5 girls are still at level I—no evident color pattern. For representational products, these same two levels tie for first place.

As to the actual colors used, the largest number (39 per cent of all pieces used) are blue. Green and red share second place, with 14 per cent of each. As to color combinations, 12 girls use only three or fewer colors. Of these, 5 use all blue; 2 use red, white, and blue; 2 use red, blue, and black.

Naming. The predominant type of naming among girls at this age is object named object (20 girls). As to the actual things named, design leads (14). House is second (13), and scene is third (9). Sky is named by 6 girls, 5 name grass, and 4 make arrow, rocket, airplane, or kite.

Compactness. The largest number of products fall at levels IV (16 girls) and V (18 girls).

Number of pieces. Considerably more pieces are used at 6 than at 5 years of age. The mean has increased from 21.22 to 24.26 pieces; the median from 14 to 20.

Timing. This remains about the same as at 5 years. The mean increases very slightly from 6:24 minutes to 6:38; the median from 5:00 to 5:30.

Symmetry. At this age 12 girls place their products symmetrically on the paper, and 13 make symmetric products.

BOYS

Type of design. By far the outstanding type of design is representational (37 boys). Of these, 24 are objects and 13 are scenes. Next come central designs (3) and slabs (3).

Form. The largest number of boys' nonrepresentational products (4 boys) for the first time reach form level V. As to representational figures, the majority are still at level II. As to the specific shape used, the largest number of pieces (25 per cent of all used) are squares; the next largest number (24 per cent) are large triangles.

Color. As with girls, the largest number of nonrepresentational figures (6) fall at level IIb, but nearly as many (5) are still at level I. For representational figures, equal numbers (9 each) are at levels I and II.

As to the colors used, the largest number of pieces (34 per cent of all pieces used) are blue. Second comes green (17 per cent of all pieces). Only 3 or even fewer colors are used by 15 boys. Of these 1 uses all blue, 3 use blue and white, and 4 use green and two other colors.

Naming. The largest number of boys name objects (22); the second largest number name scenes (13). As to the actual things named, house leads (15), scene is second (13), and design is third (11). Next come arrow, rocket, or kite (8), sky (7), and grass (5).

Compactness. By far the largest number of boys (24) fall at level V of compactness.

Number of pieces. For boys, fewer pieces are used at 6 than at 5 years of age. The mean drops from 28.40 to 22.44; the median from 20.50 to 17.50.

Timing. The timing is somewhat shorter than at 5 years. The mean drops from 6:47 to 5:37 minutes; the median from 5:00 to 4:30.

Symmetry. Products are placed symmetrically on the paper by 10 boys at this age, and 10 make symmetric products.

QUALITATIVE

GIRLS

By far the outstanding products are representational objects (23) and scenes (9). Though 5 subjects make objects using the pieces as though they were paint, 5 make objects of from 2 to 5 pieces effectively arranged, and the majority (13) make good, effective complex objects resembling the thing named. Of these, 5 are large open houses made of squares. Houses (13) are the most frequently made object.

Scenes, a highly characteristic pattern at this age (9), typically including house, grass, and sky, are constructed in horizontal rows of pieces—earth, buildings, sky. More than twice as many pieces are used per scene at 6 years as at 5 years.

Next to objects in frequency come central designs (10). These are extremely varied, perhaps representing different levels of maturity as much as differences of individual personality. They range from a simple 4-year-old circle, through an accurate symmetric arrangement of 6 large triangles, to complex arrangements of as many as 25 pieces which are less than "successful" but better than slabs.

Though objects are more frequent among products of girls than are designs, more girls than boys make designs. Small separate designs occur more (5) in girls than in boys (2).

There is, at this age in girls, very great variation in individual structures.

BOYS

By far the outstanding type of design is representational (37). Of these, 24 are objects and 13 are scenes, leaving very few products which fall outside of these classifications except for 3 large slabs and 3 central designs.

Scenes are even more conspicuous among boys than among girls. As in girls, they characteristically consist of horizontal rows of earth, buildings, and sky, with perhaps also special layers of foliage and of clouds.

Objects are made in a slightly less mature manner by boys than by girls. Three are merely small collections of chips not resembling the object named; in 3, the pieces are used as if they were paint. From 2 to 5 pieces, in effective arrangements to resemble the object named, are made by 7 boys. Large or complex successful combinations of pieces to resemble the object named are made by 9. Of this latter group, 2 are large open houses made of squares; 2 other similar houses are included in scenes.

Of the 24 objects made, 15 are houses and 8 are arrows or jets.

Design without pattern has dropped to only 5. There are 3 good central designs, fewer than in girls.

BOTH SEXES

Though two-thirds of the products are now representational, so that interest in the product presumably supersedes interest in the process, those subjects who do make nonrepresentational products continue their 5-year-old interest in experimenting with different kinds of combinations. This may be of different forms, different colors, or different positions of the pieces. Thus, though there is considerable massing of color, we also note marked interest in combinations of twosomes, threesomes, or even foursomes of the same shape or of the same color. Also there is continued placement of pieces point to point instead of side to side, as earlier.

These combinations become more elaborate than earlier. Six-year-olds achieve a square of squares or a circle of triangles, or they may make a simple design and then surround it with a circle of triangles or other pieces.

In a series of pieces of the same shape, colors tend either to mass or to alternate. This alternation of colors grows stronger at 7 but, in most, becomes far less conspicuous by 8. Black and white are alternated now more than earlier. In four-sided objects, each of the four sides may be of a different color or type of color combination.

Though true frame-and-item products are not conspicuous here, many subjects do group many pieces near the edge of the paper. Some try to fit pieces neatly at the corners, but they are seldom successful, and seldom are the four corners alike.

Many use all six colors, each in a different shape. Others, probably superior, treat one half of the paper in one sort of color arrangement, the other in something different.

DEVELOPMENTAL TABLE

BELOW AGE

Scattered pieces
Combinations of 2 to 3 pieces, named or not named (unless successful)
Four-year-old circle and minor elaborations
Extremely small or very poor slabs (4 to 6 pieces, ill fitting)
Single line of squares or triangles or diamonds
Single line of fitted triangles
Small failures of designs or objects

AT AGE

* Houses
* Any large open object made of squares
Square (9 pieces or more) of squares
* Small accurate object or better (bigger)
* Six-year-old scenes: rows of earth, houses, sky
* Successful central or separate designs

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* Most highly characteristic items.

SEX DIFFERENCES

Type of design. For both sexes, representational designs lead, and, for both, the leading subclass is objects. Boys make more of each than do girls.

Form. For nonrepresentational figures, the form level of the girls is more advanced than that of the boys. For representational figures, both girls and boys make most of their products at level II. As to the specific shapes used, the largest number, in both sexes, are squares; the next most numerous are large triangles.

Color. Nonrepresentational figures, for both sexes, are predominantly at level IIb, but nearly as many are still at level I. For representational figures, the largest number (9 girls, 13 boys) are at color level IIb—partial use of color consistent with form. Boys are slightly ahead of girls. Both sexes use blue most. Green and red come second in girls; green, in boys. More boys than girls use only two or three colors per design, though 5 girls do use all blue.

Naming. Both name objects most. Girls name design second; boys name scene second.

Compactness. Boys' products are definitely more compact than are those of girls.

Number of pieces. Girls use more and boys use fewer pieces than at 5 years. Girls use more than do boys.

Timing. Girls take a longer time to complete a product than do boys.

Symmetry. Slightly more girls than boys place the product symmetrically on the paper, and slightly more make a symmetric product.

ACCOMPANYING OR CHARACTERISTIC BEHAVIOR INCLUDING VERBALIZATION

In contrast to the relatively silent—or at least—quiet Fives, many Sixes chatter away in such an expansive manner that in some instances talking interferes with their work. There is characteristically much more expenditure of energy, more expressed enthusiasm, and more talk at 6 than at 5 years of age.

Verbalization, which is the chief activity except for actual manipulation of Mosaic pieces, is employed in many different directions:

Chiefly, the child may explain his own process as he works: "I try to get things that fit. . . . I'm making a Ferris wheel, and here's where the machinery is. I didn't know it was going to turn out this way. I'm having a little trouble with myself—so I went to the Habit Doctor. I'm better now. . . . Now what square would fit in there? Now I'm going to make this turn down here. Going to be a splatter of colors"; or "I want to make a line of little squares. Now I'm going to start making the side. Now I'm going to start putting the blue in again."

He may praise himself and his own behavior: "Aren't I good? I really know how to make things, don't I? This is easy"; or he may express hope that his product will turn out satisfactorily: "This will go with this—I hope."

Several ask the examiner if he knows or can guess what they are making. There is much friendliness and smiling directed to the examiner. One child asks, "Want me to show you a trick?" Enthusiasm extends in all directions but may especially be directed to the Mosaic: "I like a yellow one. I like yellow everything. Now put a blue one there. Blue is pretty!"

Though extraneous conversation or general sociability may get in the way of activity directed toward the Mosaic board and pieces, most subjects are, at this age, both interested enough and able enough to make an effective design or product and one which satisfies the maker.

There is considerable emphasis on houses, sky, sun, and trees. Several subjects, at this age, make either scattery or solid products which do not look like much of anything, but they describe what they have made very fancifully. Verbalization and imagination in some, as earlier, are considerably ahead of acutal manual performance.

ILLUSTRATIONS

(SEE PLATE 6)

Girls: a) Central design
b) Object: house
c) Scene: grass, flowers, tree, sky, sea

Boys: d) Object: arrow
e) Object: house
f) Scene: house, dirt, grass, sky, sun

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CHAPTER 14

Seven Years

	G	B	All		G	B	All		G	B	Al
A. Nonrepresentational without pattern				B. Nonrepresentational with pattern				C. Representational			
2. Scatter singly	0	1	1	2. Central design	10	3	13	1. Object	11	18	29
4. Slab				4. Fills tray				2. Scene	16	17	33
Small	1	1	2	Frame-and-item design	2	4	6	All C	27	35	62
Large	0	1	1	Whole pattern	4	1	5	D. Mixed, representational and nonrepresentational	1	3	4
				5. Separate designs	5	1	6				
All A	1	3	4	All B	21	9	30				

QUANTITATIVE

GIRLS

Type of design. The leading type of design is representational (27), of which 16 are scenes and 11 are objects. There are also 10 central designs.

Form. Among nonrepresentational designs, levels V and VI are tied for first place, with 7 girls each. This is the first age at which products occur outstandingly at level VI. As to representational products, the largest number of products (13) fall at level II. As to the actual shapes used most, squares lead (30 per cent of pieces used), and triangle comes second (19 per cent).

Color. Among nonrepresentational products, the level of color use is by far the highest to date and actually exceeds that at 8 years. Level IV—full color pattern repeating form—leads, with 9 girls at this level. Among representational designs, level IIb—partial use of color consistent with form—leads (14 girls).

As to the actual colors used, blue leads (32 per cent of all pieces used), and black comes second (17.5 per cent). Considering color combinations, 12 subjects, as just earlier, use only three or fewer colors. Of these, 2 use all blue; 3 use blue and black; and 3 use red, white, and blue.

Naming. Scene so named (16 girls) is the predominant level of naming. Design so named (15) comes second. As to the actual things named, design leads (15), scene comes second (14), and house third (11). Next come sun or moon (7), sky (5), and building other than house (5).

Compactness. The products are a little less compact than at the preceding age. Here the largest number of products (16) are at level IV.

Number of pieces. The mean is considerably larger, but the median is lower than at 6 years. The mean has increased from 24.26 pieces to 26.92, but the median has fallen from 20.00 to 15.50.

Timing. Timing tends to be longer at 7 than at 6 years. The mean has risen from 6:38 minutes to 8:03, though the median remains constant at 5:30.

Symmetry. As at 6 years, 12 girls place their products symmetrically on the paper, and 16, the most to date, make symmetric products.

BOYS

Type of design. The leading type of structure here is clearly representational (35), with object (18) and scene (17) appearing about equally. There are no other outstanding patterns, although 4 do fill the tray with a frame-and-item design.

Form. Among nonrepresentational designs, level V clearly leads (8 boys). As to representational products, level II (21 boys) leads. As to the actual shapes used, the square leads (33 per cent of all pieces used), and the diamond comes second (20 per cent).

Color. Among nonrepresentational products, level IIb—partial color pattern consistent with form, and level I—no evident color pattern—tie for first place. Among representational patterns, as in girls, level II predominates (18 boys).

As to the actual colors used, blue leads (38 per cent of all pieces used), and black comes second (17 per cent). Considering color combinations, the most boys to date (21) use only three or even fewer colors. Thus 2 use all blue, 1 uses all white, 2 use green and 1 other color, and 3 use green and 2 other colors.

Naming. For the first time, scene so named (17 boys) is the predominant level of naming. Object so named comes second (16). As to the actual things named, house leads (19),* scene is second (16), and design third (10); 6 boys each name boat and sky; 5 each name person and building other than house.

Compactness. The products are a little less compact than at 6 years. The largest number (15 each) are at levels III and V.

Number of pieces. Boys use clearly more pieces at 7 than at 6 years. The mean has risen from 22.44 to 25.50; the median from 17.50 to 21.00.

Timing. The time required to complete a product has increased over 6 years. The mean has increased from 5:37 to 6:50; the median from 4:30 to 5:00.

Symmetry. Only 9 boys place their products symmetrically on the paper, but 13—the most to date—make symmetric products.

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* Some of these houses are in scenes so named, and thus are not classed as objects in level of naming.

QUALITATIVE

GIRLS

Perhaps the outstanding characteristic of Sevens (though more conspicuous in boys than in girls) is the serial placement of single pieces or objects; a product may consist only of a horizontal row of diamonds, or a horizontal row of 2-piece houses across the page. This linear placement is outstanding, and the arrangement tends to be horizontal rather than vertical. Thus at least 10 of the 50 girls make outstandingly linear products, 8 others stress linearity, and many of the scenes (see Plate 7) are predominantly linear. Several make running lines of scalenes to outline some object such as house or train.

There are more scenes here than at any other age except 16. The chief change in scenes since 6 years of age is that they now tend to be simpler, may use fewer pieces, and the sky areas tend to drop out or to be more schematic than at 6.

Seven is a strong age for houses: 11 girls make houses here, including those which appear as parts of scenes, but there are only 3 people.

Central designs are varied, but most are either small and compact, such as a square of 4 small triangles, or consist of a linear arrangement of pieces in a straight line or even in a large open circle. Only 4 objects are now made at the 2- to 6-piece simple level; the remaining 7 are at a more complex level.

BOYS

Serial horizontal placement of objects or merely of single pieces is the outstanding characteristic of this age, even more conspicuous in boys than in girls. Of our 50 boy subjects, 26 produce such patterns. (See Plate 7.) Others of the 50, although not predominantly serial or linear, tend to emphasize linearity.

Outstanding at this age are objects (18). Objects are predominantly houses, of which (including those which are parts of scenes) there are 22. This is a strong age for scenes; 17 boys make scenes—more than at any other age. As with girls, scenes tend to stress the horizontal line-up of pieces, but they are simpler and give less emphasis to sky regions than do the scenes of the 6-year-old. Boys make a few more people than do girls.

Only 4 of the 18 objects are now made at the 2- to 6-piece simple level. The remaining 14 are more complex; 2 are still being made of squares arranged in a large open square.

BOTH SEXES

Fives and Sixes seem especially interested in combinations of different shapes, or different kinds of combinations of the same shapes. Sevens experiment with both form and color. At 7 we seem to get a whole new concern with the manipulation of *colors.* Since often a product is made of a serial line-up of single pieces or of simple patterns such as 2-piece houses, this allows for considerable emphasis on variety of color. Sometimes this interest in the manipulation of different colors and color combinations is expressed effectively, sometimes not. Often all 6 colors are used, or there is emphasis on the pairing of contrasting colors. Thus the product may consist of a whole row of different-colored houses (each 2-piece house of a different color or the roof of one color and the house of a second); or the paper may have several identical designs, each in a different color; or a single large design may be made of an arrangement of different colors. Color contrast is more apt to be expressed horizontally than vertically. Either single pieces or masses of pieces may be contrasted in color.

Thus, although objects and scenes predominate here, in nonrepresentational designs there is active and interested—even though not always effective—manipulation of different shapes and/or different colors. It is important here to consider the child's process as well as his product.

In the several frame-and-item designs, although pieces may be placed a little messily, often the total color arrangement is accurate, with the two sides balancing, and the top and bottom balancing. There is, in some, the beginning of a good treatment of corners. A few balance both shape and color.

With nonrepresentational patterns, as with scenes, some cut down the amount of the board covered. In general, Sevens cover less of the board than do Sixes and Eights. Some make the semblance of a frame within the actual edge of the paper.

Some subjects, in the use of form, emphasize combinations of different kinds of pieces; others emphasize different arrangements of the same kinds. Thus some arrange diamonds in alternating positions, one placed horizontally, the next one vertically. Quite a few place a single scalene under a square or flat diamond. Still others arrange scalenes in lines. Others arrange a row of large triangles, one point up, the next one point down, so that they form a solid band. Others line up squares, spaced slightly and each at an angle.

DEVELOPMENTAL TABLE

BELOW AGE

Pieces scattered or placed singly
Small clumps of pieces
Four-year-old circle or modification
Extremely small or poor slabs
Small failures of designs or objects
Two-piece houses, unless lined up

AT AGE

* Two-part houses, if lined up
* Open square houses (or other objects)
Open outline objects

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* Most highly characteristic items.

* Lines of anything; that is, serial placement of pieces or structures
* Objects of good form and slightly complex
* Designs of good form, fairly complex or complex
* Scenes simpler, more humans, sky area omitted or more schematic than at 6

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* Most highly characteristic items.

SEX DIFFERENCES

Type of design. Representational figures lead in both sexes, but much more so in boys. Girls exceed boys in nonrepresentational designs with pattern—more here than at any other age (21/9). Boys make more objects than girls, and more boys build in a linear pattern than do girls.

Form. In boys, form level V leads; in girls, levels V and VI tie for first place in nonrepresentational figures. As to representational figures, level II leads in both sexes.

Color. In nonrepresentational products, girls are somewhat ahead of boys in patterned use of color. In representational figures, level II leads in both. Blue is the leading color for both sexes, with black coming second. Only 12 girls, but 21 boys—the most to date—use only three or fewer colors.

Naming. Scene leads in both as to manner of naming. As to the actual things named, design leads in girls, house in boys.

Compactness. Boys and girls are about equally compact—both a little less so than at 6 years of age.

Number of pieces. The mean is smaller but the median is larger for boys than for girls.

Timing. Girls take a little longer than do boys to complete a design.

Symmetry. A few more girls than boys place their products symmetrically on the paper, and a few more girls than boys make symmetric products.

ACCOMPANYING OR CHARACTERISTIC BEHAVIOR INCLUDING VERBALIZATION

Sevens are often calmed down considerably in their general behavior from what they were at 6. Instead of chatting vigorously with the examiner, many merely whisper to themselves as they work. Many seem less sure of themselves than at 6. They make false starts, or comment, "Don't know what I'm going to make." Even at the finish they may remark, "I never know when I'm through." Several children, even very capable ones, seem quite dissatisfied with their first start, scrap what they have made, and begin again. Many express verbally considerable uncertainty: "Now let me see, maybe this white one could help me. Hope this turns out what I want it to be. Hard to get something to fit in there.

Kind of complicated"; or "I'm not too good at things. Let's see. They don't exactly fit, but I guess it's all right. I want to make the top row and I don't know how"; or even, "God! I don't want black in there"; or other profanity, "There's no straight pieces. Then they'd be a little better. Gad!"; or, "Oh Lord! I forgot the grass!"

Further evidence of uncertainty may be indicated by such questions as: "Do you have to name it? You picked the wrong person if you have to name it"; or, "How do you make a moon? How do you make a sun? I'm going to make a sun, at least I'll try. What's this? I wish I knew"; or by such comments as, "Oh dear! I'm very stuck what I'm going to make . . . I forgot. Are there just any straight pieces?"

Children are beginning to ask for pieces not available: "I need some long ones"; "Don't we have any browns?"; "I couldn't make cars cause there's no straight things"; or, "Do you have any circles?" Several mention that they like shiny black pieces.

Several say, when finished, still expressing uncertainty, "Guess that's all," or "I made sort of a group of colors."

Several are now quite size conscious, as well as time conscious: "No doorknob. That's OK. If I picked one of these things it would be bigger than the door." Several comment about how much time they are taking or will be allowed to take.

Several comment that they are making, or will make, a puzzle. An interesting verbalization at this age is the personal touch given by such comments as, "I'm making one of *my* best designs."

Sixes may boast spontaneously about how well they are doing or have done. Sevens are less likely to volunteer self-compliments, but they accept and affirm compliments paid to them. Thus they will say, "I think it is, too," if the examiner says they have made a nice product.

ILLUSTRATIONS

(SEE PLATE 7)

Girls: a) Linear design
b) Separate designs
c) Scene: village

Boys: d) Linear design
e) Scene: sailboat, rowboat, water, sun, sky
f) Scene: house, trees, hills, airplane

CHAPTER 15

Eight Years

	G	*B*	*All*		*G*	*B*	*All*		*G*	*B*	*All*
A. Nonrepresentational without pattern				B. Nonrepresentational with pattern				C. Representational			
4. Slab				1. Fundamental	2	0	2	1. Object	14	20	34
Small	0	1	1	2. Central design	9	4	13	2. Scene	11	14	25
Large	5	3	8	3. Fills tray				All C	25	34	59
5. Over-all	0	2	2	Frame-and-item design	5	4	9	D. Mixed, representational and nonrepresentational	3	0	3
				Whole pattern	1	1	2				
				5. Separate designs	0	1	1				
All A	5	6	11	All B	17	10	27				

QUANTITATIVE

GIRLS

Type of design. Representational designs definitely lead at this age (25 girls), with the leading subclass being objects (14). There are 11 scenes. Nonrepresentational designs with pattern come second (17), 9 of these being central designs. This is a high point for frame-and-item designs (5).

Form. Among nonrepresentational designs, level VI leads for the first time, with 9 girls reaching this level. Among representational designs, level III leads (11 girls) for the first time. As to the actual shapes used, the square leads, as at earlier ages. Here 29 per cent of all pieces used are squares; large triangles come second (19 per cent).

Color. In nonrepresentational designs, level IIb—partial use of color consistent with form—predominates, with 9 girls at this level. However, 8 girls now are at level IV—full color pattern repeating form. Among representational designs, level IIb predominates (10 girls).

As to the actual colors used, blue leads with 24 per cent of pieces used. Black comes second (17.5 per cent of pieces). Considering color combinations, this is a low point for the use of only one, two, or three colors. Only 7 girls use only three colors or fewer. Of these, 2 use all blue; 3 use red, white, and blue.

Naming. As to the level of naming, the leading type is object named object (13); design named design (11) and scene so named (11) come next. As to the actual things named, house leads (13 girls), design comes second (12), and scene comes third (11).

Compactness. The products, for the most part, fall either at level IV (15 girls) or at level V (21 girls).

Number of pieces. More pieces are used than at 7 years. The mean increases from 26.9 to 27.6; the median from 15.5 to 23.5.

Timing. The products take somewhat longer to build than at 7 years. The mean is about the same, 8:03 minutes at 7 years and 8:06 at 8 years, but the median increases from 5:30 to 7:00.

Symmetry. As to placement on the paper, girls' products are slightly more symmetric than at 7 years. At seven years, 12 products were symmetrically placed on the paper; at 8, there were 15. As to symmetry of the actual product, this is one of the highest points, 22 products being classed as symmetric.

BOYS

Type of design. Representational patterns definitely lead here (34 boys), with 20 objects and 14 scenes. There are 4 central designs and 4 frame-and-item patterns.

Form. Among nonrepresentational designs, the leading class is V, with 7 designs at this level. Among representational designs, level III leads (14 boys) for the first time. As to the actual shapes used, squares lead, as at earlier ages (31 per cent of all pieces used). The diamond comes second, with 20 per cent of all pieces used.

Color. As to nonrepresentational designs, level I—no evident color pattern—still predominates, with 5 boys at this level. As to representational designs, levels I and IIb tie for first place, with 9 boys each.

As to the actual colors used, blue leads (27 per cent of all pieces used), and black comes next with 18.5 per cent. Considering color combinations, this is a low point for the use of only one, two, or three colors. Only 8 boys use only three or fewer colors.

Naming. As to the level of naming, object named object leads (17 boys). Scene so named comes second (14 boys). As to the actual things named, scene leads (14), design comes second (11), house and other building are third, with 10 each. Seven boys name arrow, rocket, or kite.

Compactness. The largest number of products (24) falls at level V, but 13 still are classed at level IV.

Number of pieces. This increases considerably from 7 years. The mean rises from 25.5 to 34.1; the median from 21.0 to 25.5.

Timing. The products take considerably longer to complete than at 7 years. The mean rises from 6:50 minutes at 7 years to 9:02 at 8; the median increases from 5:00 to 8:00 minutes.

Symmetry. Concerning placement on the paper, there is an increase in symmetry over 7 years. Now, 13 boys place products symmetrically on the paper. As to symmetry of the actual product, boys are less symmetric than girls and only slightly more symmetric than at 7 years. Now, 15 boys make symmetric products.

QUALITATIVE

GIRLS

The products are large and more variable than at 7 years, and it is more difficult here to define central trends. Outstanding at this age are representational objects (14) and scenes (11), both of which feature little 2-part houses, several to a page. (In all, including scenes, 13 girls make houses, and 6 make other buildings. Houses are frequently placed in rows; at least there are 9 rows of houses.) Conspicuous is the odd orientation of objects, which may or may not suggest perspective. At any rate, it gives the impression—unless considered as perspective—of being inaccurate placement; for example, in several scenes the houses appear in what might be thought of as the sky. Scenes are usually made of houses and trees.

In general, whether scenes, series of objects (as several houses), frame-and-item, or central design, a little more of the tray seems to be covered than at 7 years. Even slabs are larger, and there are more slabs than at 7 years. On the average, 27.6 pieces are used per child, as against 26.9 at 7 years. At least 10 subjects cover, loosely, the entire page.

There are 9 central designs, and these designs are predominantly symmetric. Some of these (see Plate 8) are becoming linear. This mature placement of pieces foreshadows patterns typical of teen-age designs. There is some massing of diamonds especially to form 4-piece diamond shapes though one girl makes an 8-piece star, and conspicuous use of diamonds by others, though squares are used more than any other shape. The quality of the designs seems much improved over 7 years. There are some remnants of basic 4-year-old circles.

Though there are many exceptions, just as linearity seems to be the key to the 7-year-old pattern, to some extent a grouping of pieces in a somewhat solid mass seems characteristic of 8. Sometimes these masses are made of solid horizontal rows of pieces combined vertically.

Frame-and-item designs occur here more than at any other age. Note the bright, varied colors.

BOYS

As often with boys, objects (20) and scenes (14) lead. Of the objects, by far the most are buildings—10 houses and 10 other buildings, 3 of which are garages. Typical houses seem to be more complex than in the girls' productions. Only 5 are simple 2-piece structures, and of these only 3 are in rows.

There are 5 animals, 4 of these involving extremely clever manipulation of shapes. One boat utilizes this same kind of clever form fitting, not seen much in girls. Things in action are made by 2 boys.

Boys, like girls, have things placed oddly on the paper. There are several (4) phallic-looking arrows and rockets, and 6 others which have a phallic appearance.

There are 5 variations of the basic 4-year-old circle.

In general, as with girls, figures are solid and massed. There are several (4) frames and items. Figures are larger than at 7 years, the mean rising from 25.5 to 34.1.

Note the use of adjectives, an elaboration of a basic theme, just as the forms themselves are more varied: "fat-bellied bird," "winter scene," "Indian design," and "bad man's castle."

As with girls, there are several excellent symmetric patterned designs, suggestive of those which occur so commonly in the teens, but, also as with girls, there are more slabs than at 7 years.

BOTH SEXES

Variety and *multiplicity* are two of the outstanding characteristics of Eights' mosaics. There is a breaking up of the simple serial, rather uniform placement found at age 7. This breakup may be achieved in any of several ways: (1) odd placement of figures all over the paper, often achieving the effect of perspective; (2) several different small products; (3) variety of kinds of color usage; (4) variation of product by adding pieces at odd angles; that is, breaking up straight or simple lines (this is particularly seen in a series of houses, with each roof often of a different shape); or (5) colors and shapes often correctly placed but with one color or one shape incorrect. That is, Sevens, once started, tend to perseverate and to repeat the same kind of thing. Eights are more apt to break things up and to vary them.

Eights seem to be more interested than Sevens in the sheer manipulation of pieces. Sevens may decide on some simple pattern and then repeat it. Eights appear to be working with different possible combinations of shapes and colors. Thus even a simple pattern, such as the basic 4-year-old circle which frequently occurs at 8, may be made of six different colors. In general, however, a determined use of all six colors may be more characteristic of a younger age. Overconcern with this use of all colors may take the place of good manipulation of form. Probably a little more characteristic of Eights is working with a certain number of colors. Thus, if a child makes three or four separate designs, each one may be made of three, or four, different colors.

For children of both sexes, this is the high point for frame-and-item designs. Excellence of the frames can be a good clue as to the effectiveness of performance. In some, frames are correctly made even to the matter of corners. Some fit pieces into each corner with remarkable accuracy, and balance the design from one corner to the next; in others, the frames are decidedly ineffective.

In true frame-and-item products, the frame surrounds the outer edge of the paper; in others, following Sevens' tendency to reduce or lower the skyline of scenes, the frame or framing pieces are at some distance inside the edge of the paper. These frame-and-item patterns are characteristic of the increasing spread of Eights. Another example of this is the combination of several rows or serial pieces into more solid blocks of pieces than are usually seen at 7 years.

Though it is still too early to get the four-way correct balance characteristic of the teens, several Eights do make a balanced product, with a good clear center line and the two sides balanced. Often, however, some one shape or color will be incorrect. There are also a few examples of spaced designs characteristic of the teens.

Note that there is considerable movement, either mentioned or implied: a man playing ball or walking, a dog going into doghouse, or smoke coming out of a chimney.

DEVELOPMENTAL TABLE

BELOW AGE

Pieces scattered or placed singly
Small clumps of pieces
Four-year-old circle or modification
Lines of squares, triangles, or diamonds, just joined together (as differing from carefully spaced 7-year-old linear responses)
Extremely small or poor slabs
Small failures at designs or objects
Two-piece houses (unless several lined up or grouped)
Seven-year-old lines of pieces spaced are on the immature side, representing 7 more than 8
Large open houses, unless extremely vertical, horizontal, or angulated; or any houses under 5 pieces
Extremely 6-year-oldish scenes with a band of sky, band of clouds, band of houses, band of grass or earth

AT AGE

Large solid houses, or open square houses if very horizontal, vertical, or angulated
* Scenes: no sky, and odd placement suggesting perspective
* Successful designs, especially if symmetric
* Successful objects
* Large slabs, one or several sides fit, or good islands of form
* Structures becoming bulky and solid as opposed to 7-year linearity
* Frame-and-item design
* Small 2-piece houses in rows or groups

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* Most highly characteristic items.

SEX DIFFERENCES

Type of design. Both sexes make representational designs most, with objects leading. As at every age from 4 years following, however, girls make more nonrepresentational patterned designs than do boys, and boys make more representational patterns than do girls.

Form. For nonrepresentational designs, girls are ahead of boys in form level. For the first time the largest number of girls are at level VI. Most boys are still only at level V. As to representational designs, both reach level III for the first time. As to the specific shapes used, in both the squares predominate; the diamond comes second in boys, the large triangle in girls.

Color. Nonrepresentational patterns in girls are definitely more mature as to use of color than in boys. As to representational designs, girls perform chiefly at level IIb; in boys, I and IIb are tied for first place. Blue is the leading color in both, and black comes second. Considering color combinations, this is a low point in both sexes for the use of only one, two, or three colors.

Naming. As to the level of naming, object so named is first in both.

Compactness. Boys' products are a little more compact than are girls'.

Number of pieces. Both sexes use considerably more pieces than at 7 years, and boys use considerably more, on the average, than do girls.

Timing. Both take longer than at 7 years to complete a product, and boys take about a minute longer, on the average, than do girls.

Symmetry. Slightly more girls place their products symmetrically, and many more girls than boys build symmetric products.

The chief differences appear to be that boys make many more objects and scenes than do girls; girls make more designs than do boys. Girls make particularly little houses, spaced out in a row. Boys make larger houses and more other buildings. Boys, as usual, have more rockets, planes, etc., and many more phallic symbols in general. Girls make more trees and flowers. Boys' products look more solid; girls' more spaced.

ACCOMPANYING CHARACTERISTIC BEHAVIOR INCLUDING VERBALIZATION

Some 8-year-olds are extremely talkative during the test situation. They ask for certain pieces and tell what they are for: "Do you have anything that would make the prow of a boat?" They seem to think first of what they want to make and then try to find the pieces they could use, instead of, as some do earlier, pushing pieces together and then naming their product. Many show excellent imagination and comment about this: "Supposed to test my imagination?" Some of their talk is merely silly as at 4, but a good deal is about what they are making or may even be directed toward belittling their own products.

As in other test and life situations, the 8-year-old is quick to belittle his own product: "House. But not much of a house. I think it looks awful, don't you?" Many Eights seem to be seeking praise in this way: "An arrow. It isn't a very good one"; or, "I guess it's a house. It's cockeyed"; or "House. Kinda crumby though." Adjectives are graphic: "Fat-bellied bird," "bad man's castle."

There is some complaint about a lack of the type of pieces they need: "Get the piece I want. Have you got any pieces like this only flat on the bottom? You know, no point on the end?" or "This piece is kinda small but this piece is kinda big."

The 8-year-old is characteristically expansive in his comments: "I could make thousands of things, but I don't have the things to do it with"; or, "Most every color I could find to go together."

There is some direct addressing of pieces: "You dumbbells, stay together!" or, "You rascal!" as a piece slips. This somewhat resembles the behavior of the 4-year-old. Also, like Fours, when they are drawing, some Eights start to make one thing, then it turns into something else, and finally even into some third thing: "Guess I'll make a house. Doesn't look like a house. More like a tree." Quite a few now say that they don't know what they're making or don't know what it's going to be, or they ask, "What shall I make?" Asked what they have made, they reply, "Nothing"; or, "Nothing—just a design."

There is much use of the word "supposed": "What are we supposed to do?" "That's supposed to be a house." There is also considerable reference to what they made last year: "Maybe I could make a bigger kind of house than I did before."

There is an effort at careful fitting of pieces, and much interest in having the pieces fit and look "right."

Superior Eights are very active and imaginative: "This is two boys playing guns. See the fire from the guns. . . Sun up here. The boys are hiding behind these blue things—posts or trees"; or "A windmill going fast"; or "There are lots of things I could make but I can't make a mockingbird or stars."

Typical verbalizations at this age follow:

Don't think I'm going to have enough. . . . Bet you can't guess what this is going to be. It happens to be our school. This is the walk. There's so many walks there, I don't think I'm going to have enough. Not doing very well on this. Going to start working up at the top now. I'm not going to make the school very big, because I don't have enough. This is harder than I thought it would be. I'm having a hard time. How's it look? I think it looks awful. I know somebody that does better at this than I do. [Who?] You.

You could color like on the paper or make designs. Guess I'll make a horse. . . . I'm going to use a different color. One black ear—he's going to be fancy. How could you straighten it out? You could straighten it out with a diamond. This is hard but still I think you can make it. . . . Now how is it we've started the slant? Now we have to make the ears. He seems sort of strange, but it's coming. . . . This is a hopeless case. It doesn't work. I'm going to try something else in about a second. . . . Sort of close, but you get the idea. You get the idea, anyway.

ILLUSTRATIONS

(SEE PLATES 8, 9)

Girls:
- a) Central design
- b) Frame and item: person and frame
- c) Central design
- d) Scene: houses
- e) Scene: houses, two boats, kite
- f) Scene: village

Boys:
- a) Central design
- b) Object: rockets
- c) Object: horse
- d) Object: house
- e) Object: boat
- f) Scene: summer scene—bridgehead, pyramids

CHAPTER 16

Nine Years

	G	B	All
A. Nonrepresentational without pattern			
4. Slab			
Small	2	2	4
Large	4	3	7
5. Over-all	1	0	1
All A	7	5	12

	G	B	All
B. Nonrepresentational with pattern			
2. Central design	13	5	18
3. Design along rim	3	1	4
4. Fills tray			
Frame-and-item design	2	2	4
Whole pattern	1	3	4
5. Separate designs	2	0	2
All B	21	11	32

	G	B	All
C. Representational			
1. Object	11	24	35
2. Scene	10	10	20
All C	21	34	55
D. Mixed, representational and nonrepresentational	1	0	1

QUANTITATIVE

GIRLS

Type of design. Nonrepresentational designs with pattern (21) and representational patterns (21) tie for first place. Within these classes, central design (13) and object (11) lead.

Form. Level VI of form predominates slightly over level V for nonrepresentational patterns. The majority of products fall at either level V or level VI. For representational patterns, 8 fall at level II, 9 at level III. As to the shapes used, this is the last age at which squares predominate, 28 per cent of pieces used being squares. The *diamond comes second for the first time,* with 22 per cent of pieces used.

Color. The level of color use improves after this age, but here, for nonrepresentational designs, level IIb—partial use of color consistent with form, and level I—no evident color pattern—tie for first place with 10 subjects each. For representational patterns, level IIb—partial use of color consistent with form—leads (8 subjects) but is nearly equaled by color pattern adding significance to form (naturalistic use), with 7 subjects.

As to the actual colors used, black leads (20.5 per cent of all pieces used), and blue comes next (20 per cent). For combinations of colors, only 8 girls—fewer than at the years preceding—use only three or fewer colors. One uses all blue; 1 uses all black; 2 use green and two other colors. Three use red, white, blue, and black.

Naming. Design named design leads here, with 22 girls at this level of naming. As to the things named, design leads (22), scene comes next (9), house next (6), and other buildings (4) comes last.

Compactness. By far the majority of products (28) can be scored at level V.

Number of pieces. Definitely more pieces are used, on the average, than at 8 years. The mean rises from 27.6 to 30.4; the median from 23.5 to 29.

Timing. Timing is slightly longer than at 8 years, on the average. The mean increases from 8:06 minutes per child to 8:56; the median from 7:00 to 8:00.

Symmetry. This is one of the two high points for girls for symmetry of placement on the paper, 15 girls placing their products symmetrically. This is also a relatively high point for symmetric products (20).

BOYS

Type of design. Representational design is by far the leading type of design in boys, with 34 falling into this classification. The leading subclass is object (24).

Form. Nonrepresentational products are quite evenly distributed among the different levels. Level V predominates slightly. As to representational patterns, the largest number (17) are at level II. As to the actual shapes used most, *for the first time diamonds predominate* (28 per cent of all pieces used). The square comes second (23 per cent of pieces).

Color. As with girls, in nonrepresentational designs, levels I and II approximately tie for first place. For representational designs, level IIb—partial use of color consistent with form—predominates (12 subjects).

As to the actual colors used, blue leads (36 per cent of all pieces), and black comes next (21 per cent). For combinations of colors, many more boys than girls use only a slight variety of colors: 18 use only three or even fewer colors. Of these, 4 use all blue; 1 uses all black; 2 use blue and white; 2 use black, blue, and white; 2 use red, black, and white.

Naming. Object named object leads here as to the level of naming (23 subjects). As to the things named, design leads (12), and scene comes next (9). There are 7 houses, 7 persons, 6 boats, and 5 airplanes and rockets.

Compactness. The products are becoming increasingly compact, with 26 per cent of products being at level V.

Number of pieces. The number of pieces drops. The mean falls from 34.1 to 27.3; the median from 25.5 to 24.

Timing. The products take much less time to produce now than at 8 years. The mean drops from 9:02 to 6:44; the median from 8:00 to 5:30.

Symmetry. Slightly fewer products than at surrounding ages (12 here) are placed symmetrically on the paper, but this is the high point to date for symmetric products (19).

QUALITATIVE

GIRLS

For the first time, at this age, patterned nonrepresentational designs equal representational designs (21 each). This emphasis on patterned nonrepresentational designs appears here in girls strongly for the first time, drops out at 10 and 11 years, and is seen again strongly at 12 and 13. There are now 13 central designs, 11 objects, and 10 scenes, so that responses are, obviously, very varied here. In fact, behavior is so diverse that it is difficult to find conspicuous central trends which characterize the age. Variety may be the key here. Thus, for instance, designs are, on the average, larger than at 8 years, yet several subjects make very small blue or black figures. In the large complex figures there is often intricate balance or contrast. The small, neat, compact products may be little houses or little men, often blue, or they may be a neat compact design of 12 or fewer pieces; that is, the designs tend to be very large or very small. Black is the color used most, and blue comes next. Also, the absence of red (which is used less than any other color but yellow) is conspicuous.

The things named most are design (22), scene (9), house (6), other building (4), tree (5), and person (4).

As at 8, there is considerable use of adjectives in describing products, such as "kaleidoscopic design" or "snowflake design," and there is some tendency toward confabulation:

> Oh now I know, an Indian village—tents. . . . These are hills. There. . . . These Indians have moved into the forest and put up their tents now. They go to fight with some other Indians and when they come back their tents are all down. So they sunk and stole all their food so they had to build a city somewhere else. The end.

There is some neat, orderly, and intentional superimposition of piece on piece. Scenes are varied and now reveal glimpses of individuality as well as of age.

BOYS

In boys, as usual, representational designs far exceed nonrepresentational. There are 34 representational—24 objects and 10 scenes. Only 5 are central designs.

Of objects, the most are houses (9) or other buildings (2). There are 7 persons, 6 boats, and 5 airplanes and rockets. Though patterns of girls are, on the average, larger than at 8 years, those of boys are smaller, and very small designs are conspicuous. These are characteristically black or blue, and these two colors predominate. There are 14 patterns with no red; 11 products are all, or nearly all, black or blue.

The scenes tend to be made of small clumps of dark colors, simple rows of houses (as at 8) embellished with a few extra objects to turn them into a scene, featuring phallic-looking vehicles, or are blue and white, or blue, black, and white sea scenes. Note both the whirling designs and the diamonds made of diamonds.

BOTH SEXES

There is marked integration (even though variety) at 9 years, as opposed to the wide spread and lack of precision at 8. Now both color and form are being used effectively. Patterns and products are more orderly than earlier. Most are quite effective. Colors and shapes may be balanced and contrasted, and there is marked accuracy in many. In many products, however, there is one offbeat color—just one yellow, for instance, for which there appears to be no reason. Or there may be just one piece which is an offbeat shape. If the child is making an object, he often utilizes this offbeat piece as if it had been placed intentionally. In nonrepresentational designs, however, it stands out as a surprising, though very characteristic, inaccuracy.

There is some ingenious and rather new placement or combination of pieces which involves diagonal lines of pieces across the tray, zigzag placement of pieces, or a combination of two diamonds and a square into what resembles an optical illusion; or pieces may be placed around an open center in a way that permits the viewer to see alternating shifts of figure and ground; or pieces may be superimposed on other pieces.

In some Nines, we have an elaboration of 7-year-old serial placement. Combinations of pieces are arranged serially as at 7, but much more elaborately.

There is more emphasis of design along the rim than at surrounding ages. This may be placement of pieces around all four sides of the tray, or on fewer than four sides.

Color is being used more effectively, both in representational and in nonrepresentational designs. White is being used the most to date in both boys and girls, and thus seems conspicuous even though it is not a leading color. We note the use of black and white, blue and white, or black, blue, and white. Using all six colors in an arbitrary lined-up manner, just for the sake of getting them all in, seems immature at this age.

Along with 10 and 12 years, 9 is a high point for slabs. Slabs resemble the intricate, elaborately planned large designs characteristic of this age, but actually they are an unsuccessful deviation of this complex arrangement.

DEVELOPMENTAL TABLE

BELOW AGE

Any 8-year-old types of failure

Any nonpatterned, nonrepresentational designs except slabs

AT AGE

- * Rows of 8-year-old houses, slightly embellished
- * Scenes: houses and trees main theme; in boys, vehicles, or blue, white, and black sea scenes
- * Large, solid fitted patterns
- * Very tiny blue or black objects or designs; absence of red
- * Slabs, most pieces fitting on most sides
- * Any successful design
- * Any successful object
- Edge design
- Frame-and-center design
- Whirling design
- Diamond made of diamonds (parts of larger structures)
- * Strong use of black

---

* Most highly characteristic items.

SEX DIFFERENCES

Type of design. Although, as at most ages, girls make more nonrepresentational designs with pattern than do boys, and boys make more representational designs than do girls, this is the first age since 3 years at which girls make as many nonrepresentational designs with pattern as representational patterns (21 each).

Form. Girls' nonrepresentational designs are somewhat better form than are those of boys. Representational designs of girls also have better form than do those of boys. As to the shapes used most, in girls, squares are used most and diamonds next. In boys, it is just the opposite.

Color. The use of color is about the same for the two sexes for nonrepresentational patterns. Girls are more advanced in representational designs. Black and blue are the leading colors used by both, black leading in girls and blue in boys. With boys, there is much more use of just a few colors, especially all blue.

Naming. As to the level of naming, in girls, design leads; in boys, object. Among the objects named there are marked sex differences. Boys have more persons (4/7), more rockets (2/5), more boats (1/6). Girls have more trees (5/1) and slightly more grass, sky, and flowers.

Compactness. Girls' products are slightly more compact than are boys.

Number of pieces. Girls use more pieces and boys fewer than at 8 years. Girls use more pieces than do boys.

Timing. Girls take longer in building than at 8 years, but boys use less time. Girls take longer than do boys.

Symmetry. More girls than boys place their products symmetrically on the paper, and 1 more girl than boy makes a symmetric product.

Patterns are so extremely varied at this age that it is difficult to summarize and compare one sex with the other. Boys do make more of the small dark designs which seem so characteristic of this age. Boys make more phallic-shaped patterns and more vehicles than do girls; girls make more grass, trees, and flowers.

ACCOMPANYING OR CHARACTERISTIC BEHAVIOR INCLUDING VERBALIZATION

The 9-year-old is quieter again, being far less talkative, as he works at the Mosaic test, than he was at 8 years of age. Nines, during a test of this kind, often have less to say to the examiner than do 8-year-olds; in fact, at this age the examiner is not required to give constant attention and response to the child, as at earlier ages. Children are not as silly and exuberant as at 8 years of age, are less likely to disparage their own product, and do not directly address the pieces.

There is often quite a bit of discussion before they start out, often prefaced by, "I don't really know what to make." They may say, "Make a house if I can"; or "Is it possible to make a girl out of it or something?" Quite a few talk about the pieces fitting or not fitting: "Do they have to fit?"; or "Ah, it fits perfectly."

Many Nines seem quite uncertain as they work and appear to lack self-confidence. There is accompanying comment as they work: "I can't get the things to look right. Cause the things just don't fit so it will look right." There is also discussion about the kinds of pieces they would like to have and don't have: "If there were round pieces and little square pieces I could make something"; or "These don't fit and they should be smaller."

There is still, as at 8 years, quite a bit of expansive talk: "Shall I cover the whole paper?" or "You mean I could take five hours?"; or, after five minutes, "I'm not half through. Don't worry!"; or "So many thousands of things you can make!" A few still do refer to their own product as "stupid" or "corny" but without the self-criticizing bids for attention so characteristic of Eights.

Several at this age get the effect of distance or of a third dimension. Several make a design which is 2 pieces deep.

Nines often try to carry out rather complex ideas in considerable detail: "This is supposed to be some sort of a pinafore with strap, bows, and buttons."

Several now ask what the purpose of the test is, and, when it is given in a school setting, some want to know if we put it on their report cards. There is also, in some of the more introspective, quite a bit of discussion of their own actions and attitudes:

> I get kind of lonesome for my mother if I don't see her every little while. . . .
>
> I haven't put in any yellow. So stupid of me.
>
> I just like to make patterns and stuff.
>
> Are you a psychologist? Do you mind if I ask you what kind of a mind I have? I wonder if it's fun to be a psychologist.
>
> Know what I like? Space.

There is a special tendency, when asked what they have made, to reply: "Nothing. Just a design"; or "I don't know. Just a design I guess." A suggestion of the general uncertainty of many Nines is the concept "seal balancing a ball," made by several.

Most Nines are able, at the termination of the test, to assist the examiner by putting pieces back into the box, *correctly,* as the examiner traces the pieces the subject has used.

ILLUSTRATIONS

(SEE PLATE 10)

Girls:
- a) Central design
- b) Central design
- c) Scene: house, brook, trees, grass, sky

Boys:
- d) Object: boat
- e) Object: Two rocket ships and a spaceman
- f) Scene: Boat, sea gulls, clouds

CHAPTER 17

Ten Years

	G	B	All		G	B	All		G	B	All
A. Nonrepresentational without pattern				B. Nonrepresentational with pattern				C. Representational			
4. Slab				2. Central design	9	5	14	1. Object	11	19	30
Small	0	0	0	4. Fills tray				2. Scene	14	13	27
Large	7	4	11	Frame-and-item design	2	3*	5	All C	25	32	57
5. Over-all	0	1	1	Whole pattern	3	4	7	D. Mixed, representational and nonrepresentational	1	0	1
				5. Separate designs	3	1	4				
All A	7	5	12	All B	17	13	30				

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* One of these is a slab, making 5 large slabs in boys.

QUANTITATIVE

GIRLS

Type of design. The leading general class of product is representational. The leading single classification is scene (made by 14 subjects). Nonrepresentational designs with pattern come second as a general class, with central designs (9) the leading subclass, and 5 girls make a design filling the tray. Also this is the high point in girls for slabs (7).

Form. The largest number of girls' nonrepresentational products are now at level VI. Representational products are predominantly at form level III. There is a shift at this age from a predominant use of squares, as at the preceding age, to a leading use of scalenes (25 per cent of pieces used are scalenes), with diamonds second (24 per cent) and squares third (22 per cent).

Color. For nonrepresentational products, the leading use of color is evenly divided between no evident use of color patterns (9 subjects) and full color pattern repeating form (9), other types of color use occurring less than these two. For representational objects, there is a sudden increase in naturalistic use of color (12 subjects) to a peak which is equaled later at 14 and 16 years but never exceeded.

Blue is the leading single color used, with green coming second, and black third. As to special combinations of colors, these are very diverse at this age. Nearly all girls use four or more colors, and no subject uses all pieces of one color. Red, white, and blue only, or green with only two other colors do occur.

Naming. As far as the level of naming is concerned, design named design leads (18 subjects), with scene coming second (14), and object named object third (11). As to the actual things named, designs leads, scene comes next (14), and animal next (8); 5 make person and 4 each make boat, water, and tree.

Compactness. Class V leads. Fewer subjects fall in classes IV and V than at 9 years, more than at 11 years.

Number of pieces. There is a sharp increase here in the number of pieces used. The mean increases from 30.4 to 34.6; the median from 29 to 35.

Timing. Production takes a longer time at this age. The mean increases from 8:56 minutes at 9 years to 10:58 at 10 years; the median stays the same—8:00 minutes.

Symmetry. There is a slight drop in symmetry of placement; 11 girls now place their products symmetrically on the paper, as compared to 15 at 9 years. This is also a low point for symmetry of structure, with only 14 girls making symmetric ones.

BOYS

Type of design. By far the outstanding general class of design in boys at this age is representational (32), with representational object (19) the leading subclass. Second come nonrepresentational patterns, with pattern filling the tray (7) the leading subclass.

Form. The largest number of boys' representational products are still at form level II. Boys use squares most (34 per cent of all pieces used are squares—a high point for this form), with diamonds second (21).

Color. For nonrepresentational objects, the use of color is divided between partial use of color consistent with form (6 subjects) and full color pattern repeating form (7 subjects). For representational objects, full color pattern repeating form definitely leads (12 subjects) and is equaled in quantity only at 11 years.

As at most ages, blue is the leading single color used, though it has fallen off sharply since its high point at 9 years. Black comes second and red third in the order of prominence. As to special combinations of colors, there is less variety of color than in girls: 16 subjects use three or fewer colors, and 2 each use all blue or all black. Blue and white; blue and black; red, white, and blue; or red, white, and black are also conspicuous.

Naming. As to the level of naming, object named object leads (19), with design named design and scene tied with 13 each. As to the actual things named, design and scene tie at 13 each, with airplane, rocket, arrow, or kite next at 8, and person next at 7. (Considering all types of vehicles combined, 15 boys give this response.) Boat and water follow with 5 each.

Compactness. Class V definitely leads. There are just about as many products in classes IV plus V as at 9 years and 11 years.

Number of pieces. There is a very sharp increase here in the number of pieces used. The mean increases from 27.3 to 37.5 pieces per subject; the median from 24 to 30.5.

Time. The time consumed is longer than at 9 years. The mean increases from 6:44 minutes to 9:58; the median from 5:30 to 9:00.

Symmetry. This is a relatively high point for symmetric placement of the product on the paper, 14 boys placing their structures symmetrically. It is also the high point to date for symmetric structures (21).

QUALITATIVE

GIRLS

There seems to be great variety in girls' products, even though there are fewer different classifications than at 9 years. It is rather difficult to determine the outstanding features of Tens. One conspicuous feature is large, solid, bulky products. This effect of solidity can be gained from solid combinations of squares, or from blocks made up of interlocking 4-year-old circles of large triangles. Also, there are more designs filling the tray than at any other age from 10 to 16. Some of these are made of accurately placed small patterns, and some use space as part of the design. More pieces are used, on the average, than at any other age to date (a mean of 34.6, exceeded only at 13 years). The mean time for building is also the longest to date and is exceeded only at 11 and 12 years.

There are a few of the large square designs and objects made of squares which characterize the products of boys, though the leading shape used is, at this age only, scalenes, with diamonds coming second.

The largest single item—more than at any other ages except 7 and 16 years—is scenes, which are made by 14 girls. Scenes are larger than at any age to date (a mean of 40.9 pieces) and feature few houses or people but many horses and other animals, many water scenes, and the use of massed pieces as if in painting. Also, some scenes are stylized, and some have a central figure springing from a 4-year-old type of circle.

There are the most slabs to date (large slabs), the most representational objects in the 10- to 16-year range except for 16 years (25), and the least nonrepresentational designs with pattern (only 17).

It is, at least in part, the small number of central designs and the large number of varied scenes which give the products of girls at this age such a diverse appearance. (Mosaic designs from a supplementary group of 10-year-old girl subjects showed more emphasis of squares, especially of square buildings, comparable to that seen in our boys.)

This is the last age for frame-and-item designs, many of which are extremely accurate as to the shape and color of pieces. Corners tend to be treated elaborately and accurately.

BOYS

The central trends and characteristics of the age show themselves more clearly in boys than in girls. Outstanding is the predominant use of squares: 2 subjects use squares only (make large, square central designs), and 14 more use squares predominantly.

Boys make more representational objects than at any following age except at 11 years—32 in all. Of these, 13 are scenes and 19 are objects. Many of the scenes and most of the objects are made predominantly of squares. (See Plate 11.)

Rockets appear as the outstanding object (8 of these), and they all resemble each other closely, being made chiefly of squares with side projections. Several of the 7 men resemble the rockets, and, in fact, it is sometimes difficult to distinguish representational from nonrepresentational products.

There are 5 square designs and 5 squarish buildings. The square is the outstanding shape used by boys at 10. Red and black are the predominant colors. As contrasted to only 4 in girls, there are 15 boys' designs which feature some type of projectile or vehicle.

It is perhaps noteworthy that 2 boys make airplane and tower, or guided missile and launching stations, and that houses have projections, other than chimneys, coming out from the roof. Boys make only 4 slabs. Of the 13 patterned designs, 7 are patterns filling the tray.

DEVELOPMENTAL TABLE

BELOW AGE

Any 9-year-old-type failures
Design merely along rim
Rows of 8-year-old 2-piece houses
Nine-year-old-type scenes
Very tiny blue or black object or design

AT AGE

* Large solid patterns, especially those featuring squares
* Slabs, most pieces fitting on some sides
* Any successful design or object
Frame-and-center design
Whirling design
* Scene: horses and animals strong; houses out; water scenes (girls); person and vehicles, action, use of squares (boys)
* Building or scene made of several V rows of squares, massed
* Projectiles or vehicles (boys)
* Whole pattern filling tray

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* Most highly characteristic items.

SEX DIFFERENCES

Type of design. In both girls and boys, representational design leads, but in girls the leading subclass is scenes; in boys, objects. In both, nonrepresentational designs with pattern come second, but in girls central designs lead; in boys, patterns filling tray are most popular.

As from 10 through 14 years, however, boys definitely make more representational designs than do girls (25/32). Girls definitely make more nonrepresentational designs than do boys; those with pattern (17/13), without pattern (7/5). Girls also make more slabs than do boys (7/4).

Form. Girls use scalenes most, then diamonds, then squares. Boys use squares most and diamonds second. The largest number of girls' representational products are at form level III, but the largest number of boys' products are still at level II. Nonrepresentational products, for both sexes, are here, and from here on, at level VI.

Color. In nonrepresentational designs, boys' color use is slightly more advanced than that of girls. Girls' products fall chiefly either at level I or level IV; boys' at level II or level IV.

In girls, a naturalistic use of color leads; in boys, full color pattern repeating form, for representational products, is first. Girls' use of color is more variegated than boys'. Girls use blue, green, and black, in that order; boys use blue, black, and red. Boys use one color only, or two or three colors only, more than do girls.

Naming. In girls, design named design leads; in boys, object named object takes first place. In both, scene comes next; then animal in girls, and rocket in boys. Girls exceed in animal (8/2), named scene (12/7), and tree (4/2). Boys exceed in house (2/4), person (5/7), rocket (0/8), and car (0/2). The sex difference in vehicles and projectiles is especially conspicuous (4 in girls, 15 in boys).

Compactness. Boys' representational designs are a little more compact than are those of girls; in nonrepresentational figures, girls seem to be slightly ahead in compactness.

Number of pieces. The mean number is larger for boys, the median for girls. All figures increase sharply over 9 years.

Timing. The mean time is longer for girls—10:58 minutes as compared to 9:58 for boys. The median is higher in boys (8:00 minutes in girls, 9:00 in boys).

Symmetry. More boys than girls make symmetric structures and place them symmetrically on the paper.

Girls' patterns seem to be more varied, boys' more alike. Boys seem to show the age most with their square designs, houses, and rockets.

ACCOMPANYING OR CHARACTERISTIC BEHAVIOR INCLUDING VERBALIZATION

Most conspicuous in Tens is the easy-going, undemanding attitude which the subject shows toward his product.

Characteristic are the following comments:

> Oh well! A little must overlap!
> Oh well! Guess I'll manage somehow!
> Oh well! Take any color that comes!
> Well I'll have to make something else if I can't make that!
> Not going to have enough. Oh well! I'll make half the building red.
> Might as well have everything blue.

Along with this casualness goes an apparent general lack of a clearly formed plan. This is shown in two ways: One is a lack of certainty as to whether they have or have not finished their product. They make such remarks as, "I can hardly ever tell when I'm finished"; or "Shall I keep going? I think I'm finished." Others show indecision and lack of definite plan by building in one way for a while and then changing their entire design. This change of plan may be accompanied by some comment such as, "No, that doesn't look right. I'll make something else," but there is not here the verbalized complaint and fuss about making a change which occurs at 11 years.

Still others verbalize directly about their lack of plan. Thus they may say, "I just put them together and that's what they turned out to be." In fact, there is almost no criticism of the colors, of the shapes, or of their own activity. Instead, Tens show considerable enthusiasm about the whole situation: "I love to do this!" or "This is going to be the gayest land in the world."

Along with the tendency not to seem to know exactly what they are building, we note that building time is longer than at 9 years. At this age particularly, in patterned design, there seems to be a marked attention to filling in the centers.

ILLUSTRATIONS

(SEE PLATE 11)

Girls:		Boys:	
a)	Central design	d)	Design: checkerboard
b)	Slab	e)	Object: jet plane
c)	Scene: turtle with reeds and water	f)	Scene: Santa Claus in sled coming to house

CHAPTER 18

Eleven Years

	G	*B*	*All*		*G*	*B*	*All*		*G*	*B*	*All*
A. Nonrepresentational without pattern				B. Nonrepresentational with pattern				C. Representational			
4. Slab				2. Central design	9	5	14	1. Objects	16	27	43
Small	0	0	0	4. Fills tray				2. Scenes	8	6	14
Large	6	3	9	Whole pattern	3	5	8	All C	24	33	57
5. Over-all	1	2	3	5. Separate designs	6	2	8	D. Mixed, representational and nonrepresentational	1	0	1
All A	7	5	12	All B	18	12	30				

QUANTITATIVE

GIRLS

Type of design. The leading general class of product is representational. The leading single classification is object (made by 16 subjects). Nonrepresentational designs with pattern come second, with central design (9) the leading subclass. There are, however, more small separate designs (6) than at any other age. Also, there are a relatively high number of slabs (6).

Form. Among nonrepresentational products, the largest number (10) make products at level VI, with 8 subjects at level V. Among representational products, the largest number (14) are at level II—less accurate than a year earlier. As to the shapes used most, the largest percentage of subjects (28.5 per cent) use diamonds. Scalenes come second, used by 26 per cent.

Color. For nonrepresentational products, the use of color is primarily a full color pattern repeating form (9 subjects), though nearly as many (7) have merely a partial color pattern consistent with form. For representational figures, the leading class is naturalistic use of color adding significance to form.

Blue is the leading color used, with white second and green third. As to color combinations, more at this age (12) than at the just-preceding ages use only three or fewer colors. Outstanding are blue and red or green and two other colors. One subject uses all white, but no others use only one color. Other combinations occurring are blue and white only, or red, white, and blue.

Naming. As far as the level of naming is concerned, design named design leads (17), with object named object falling second (13). As to the actual things named, design leads (17), scene comes next (8), then come animal, tree, and flower (6 each), and person (4).

Compactness. Class V leads, but fewer subjects fall into this category at 11 years than in the period from 8 to 10 years. In fact, 11 is one of the low points for compactness.

Number of pieces. There is a slight decrease here in the number of pieces used. The mean falls from 34.50 to 34.10; the median from 35 to 31.5.

Timing. An increase in time required to complete a product occurs here. The mean increases from 10:58 minutes to 11:16; the median from 8:00 to 10:00.

Symmetry. As at 10 years, 11 subjects place their products symmetrically on the paper. As to symmetry of the product itself, 14 subjects, as at the preceding age, make products which may be classified as symmetric. At 10 years, however, only 4 subjects make perfectly symmetric products, and now 9 do so.

BOYS

Type of design. The leading general class of product is representational. The leading single classification is object (27), and scenes are second (6). Nonrepresentational design with pattern comes next, with central design (5) and whole pattern filling tray (5) tied. This is the last age when design filling tray (5) is conspicuous.

Form. Among nonrepresentational products, the largest number (8) make products at level VI, with 5 still at level V. Among representational products, the largest number (18) are at form level III, with 15 still at level II. As to the shapes used most, the diamond and square tie for first place, each being used by 27 per cent of the subjects.

Color. For nonrepresentational products, the use of color is extremely varied: 5 subjects use full color pattern repeating form, 5 have partial color pattern consistent with form, and 4 show no evident color pattern. For representational figures, the leading class is full color pattern repeating form.

Blue is the leading single color used, with black, red, and white all tied for second place. As to color combinations, 14 subjects use only three or fewer colors, especially red, white, and blue. Four subjects use red, white, blue, and black.

Naming. As far as the level of naming is concerned, object named object leads (25 subjects), followed by design named design (14). As to the actual things named, design (13) leads, followed by boat (5) and then (4 each) by decoration, star, etc., building other than house, person, scene, plane, rocket, and train.

Compactness. Class V leads, and designs are about as fully compact as at 10 years.

Number of pieces. There is a marked decrease here in the number of pieces used. The mean falls from 37.5 to 34.5; the median from 30.5 to 25.5.

Timing. There is a marked increase in the time required to complete a product (in spite of the decrease in number of pieces used). The mean increases from 9:58 minutes to 12:31 minutes; the median from 9:00 to 12:00.

Symmetry. Fewer subjects than at 6 to 10 years place their products symmetrically on the paper (only 7 at this age). Fewer than at 9 and 10 make symmetric products. Only 15 boys make products which can be classified as symmetric. Thus it appears that symmetry breaks up somewhat in boys at 11.

QUALITATIVE

GIRLS

At 10 years of age, boys' designs seem to illustrate most clearly what we consider to be the outstanding characteristics of the age. At 11, it is the designs of girls which seem most characteristic of the age. The solid, squarish pattern of Tens seems to be breaking up into little bits at 11,* this being one of the low points for compactness. Girls' products are large, sprawling, messy, and flying apart. These products, which often cover much of the board, are achieved in various ways. Thus 6 designs and 4 objects are scattered collections of separate items. There is also 1 scene made in a scattery, piecemeal manner, and 1 scattered frame-and-center design. Slabs are large and sprawling. In all, there are 12 scattered, burst-apart patterns. Other designs are opening up, and there are several open, running, vinelike structures, even a horse's head being made in this manner. Both this covering of much of the board and the production of separate designs combine to give the flying-apart impression we get at age 11. Even some of the central designs are unsuccessful and give a rather shapeless effect.

Scenes, a more global type of structure, decline at this age, from 14 at 10 years to 8 here. Objects increase from 11 to 16—the most at any age. Of objects, the most frequently made are animals (6), especially horse; tree (6); and flower (6). There are 4 persons.

Diamonds, with their possible implication concerning the beginning of sexual interest, are the leading shape used at this age. The solid appearance characteristic of age 10, which remains in a few subjects, is now largely achieved by massing squares and diamonds. At no other age are there as many whole patterns or separate designs. It seems possible that the superior, well-organized Eleven combines spaced designs into a good or reasonably good total pattern. The less well-organized child simply produces many separate designs, largely or entirely unrelated to each other.

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* In the Rorschach a similar trend is evidenced in the tremendous increase in D% in girls (not in boys) found at 11 years.

BOYS

Boys, as a group at 11, like girls at 10, give very varied and individual performances, so that it is difficult to pinpoint a central trend or characteristic.

Boys' patterns do not show conspicuously the bursting apart or the small separate design or object quality that girls' do, though the symmetry of age 10 is definitely breaking up. Rather, the key to the performance here seems to be in the quality or nature of the object. There are more representational patterns here, in boys, than at any age which follows—33 representational patterns, 27 objects, and 6 scenes. Of these objects, the majority are quite clearly phallic in shape, and are named rocket (4), gun (2), boat (6), car (1), engine (2), tank (1), or miscellaneous (4), making a total of 20 central phallic-looking objects. Even the patterns representing figures of men (see Plate 12) tend to resemble rockets in shape.

There are 5 central designs and 5 patterned designs filling the tray. Again, as at 5½ years, some use colored pieces as if they were paint; others, as much earlier, verbalize somewhat better than they perform. There is some central-point emphasis—things arranged around a central point. There are also several whirling designs.

Thus, girls, in general, seem to be bursting apart, but boys are pulling in to make sharp-pointed figures of clearly phallic design. Boys take longer to complete their products at 11 than at 10 years of age.

DEVELOPMENTAL TABLE

BELOW AGE

Any nonpatterned, nonrepresentational designs except slabs
Six-, seven-, or eight-year-old scenes
Seven-year-old serial patterns
Eight-year-old horizontal rows of 2-piece houses
Nine-year-old small black or blue patterns
Ten-year-old square patterns

AT AGE

* Small separate designs or multiple objects
* Slabs, many pieces fitting on all sides
Scenes: water scenes, flowers and trees, horses
Central designs
* Any good object or design
Strong use of diamonds (girls)
* Phallic-shaped objects (boys)
Open, running, vinelike structures
* Whole pattern filling tray

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* Most highly characteristic items.

SEX DIFFERENCES

Type of design. Representational patterns are the leading single class of design in both sexes at this age, but, counting all nonrepresentational products together (those with pattern and those without), girls make more nonrepresentational than representational patterns. Boys make more representational patterns than do girls, and girls, as usual, make more nonrepresentational designs than do boys. Boys make more objects than do girls (16/27), but girls make more scenes (8/6). More slabs are made by girls than by boys.

Form. In nonrepresentational designs, boys' form level is a little better than that of girls, as it is also in representational designs. Girls use diamonds most, scalenes next; boys use diamonds and squares equally.

Color. Girls are more advanced in the use of color. As to the specific colors used, both sexes use blue most. Girls use white next, then green; boys have black, red, and white all tied for second place.

Naming. Design leads in girls, object in boys. Girls exceed in scene (8/4), animals (6/1), tree (6/0), and flower (6/1). Boys lead in plane, rocket (0/4), train (0/4), and boat (2/5).

Compactness. Boys' products are much more compact than are those of girls.

Number of pieces. The means are about equal. For medians, boys use fewer pieces—girls, 31.5; boys, 25.5. Both tend to use fewer pieces than at 10 years.

Timing. Boys take longer than do girls to complete a product—about 1 minute longer for means, 2 minutes for medians.

Symmetry. More girls than boys place their product symmetrically, but symmetry of product is about equal.

There seems to be more variety among the products of boys than among those of girls. Girls, especially, seem to be breaking up the more solid mass of Ten into small separate designs or objects, or into open running designs. Boys concentrate on rocket, car, boat (13), and on other phallic-looking designs and objects.

ACCOMPANYING OR CHARACTERISTIC BEHAVIOR INCLUDING VERBALIZATION

The outstanding characteristic of the child's behavior as he works at this age is his almost constant criticism and complaint—against the pieces, against the total situation, and against his own performance and product. At least one-third of our 11-year-olds express serious discontent.

Elevens express themselves as not knowing what to make, being dissatisfied with the colors and shapes, and feeling disgusted with their own performance, which, most of the time, does not come up to their own standards. They also seem to fumble and spill a good deal and to bump against their own product, thus disarranging it. They do not, however, as at some ages, criticize the examiner.

Typical comments include the following:

Not going to be too hot.
Not going to be much good.
If it comes out crumby don't blame me. You can't do anything with this thing. Look at it!
Keeps on falling apart. The pieces are too slippery.
Supposed to be a gun. Not very good, though.
Oops! They don't stay together.

ILLUSTRATIONS

(SEE PLATE 12)

Girls: a) Separate designs
b) Object: horse
c) Objects: flowers, pine tree, palm tree

Boys: d) Design
e) Object: person
f) Object: jet ship

CHAPTER 19

Twelve Years

	G	*B*	*All*		*G*	*B*	*All*		*G*	*B*	*All*
A. Nonrepresentational without pattern				B. Nonrepresentational with pattern				C. Representational			
4. Slab				2. Central design	17	10	27	1. Objects	11	25	36
Small	0	3	3	3. Design along rim	1	2	3	2. Scenes	7	4	11
Large	5	3	8	4. Fills tray							
5. Over-all	2	0	2	Whole pattern	4	2	6				
				5. Separate designs	3	1	4				
All A	7	6	13	All B	25	15	40	All C	18	29	47

QUANTITATIVE

GIRLS

Type of design. The leading general class of product is nonrepresentational with pattern. This is a marked shift over the year just preceding. The leading single classification is central design (made by 17 subjects). Representational productions come second, with objects (11) the leading class.

Form. Among nonrepresentational productions, the largest number (15) of products fall at level VI, with 10 at level V. Among representational products, the majority (11) are at level III—more accurate than the year earlier. As to the shapes used most, the diamond leads with 29.5 per cent of pieces used being of this shape. The scalene comes next, with 24.5 per cent.

Color. For nonrepresentational products, the outstanding use of color (15 subjects) is full color pattern repeating form. The number falling in this category has nearly doubled since 11 years. For representational figures, the leading color class (6 subjects) is naturalistic use of color adding significance to form.

The leading color used is blue (21 per cent of pieces used), with black, green, and red tying for second place at 17 per cent each. As to color combinations, 14 girls use only three or even fewer colors. Of these, 2 use all blue and 2 use all black; 3 use green and two other colors; 2 use red, white, and blue.

Naming. As far as the level of naming is concerned, the largest number (12) give design named design; the next largest number (10) give object named object. As to the actual things named, design comes first (12), then scene (7), then person, house, and animal (5 each), and then decoration or star (4).

Compactness. Class V leads, with 27 subjects in this class—more than at any age to date except 9 years.

Number of pieces. The mean number of pieces used by girls remains about the same as at 11 years—34.1 at 11 years, 34.5 at 12. The median decreases from 31.5 to 30.5.

Timing. The mean amount of time used at this age remains about the same as at 11 years—11:16 minutes at 11 years, 11:35 minutes at 12. The median falls off slightly from 10:00 to 9:30 minutes.

Symmetry. As to symmetry of placement on the paper, only 9 girls place their products symmetrically. This is the fewest of any age since 5. As to symmetry of the actual product, this is one of the most symmetric ages, with 21 girls making symmetric products.

BOYS

Type of design. With boys, unlike girls, the leading general class of product is representational (29), with the leading classification being objects (made by 25 subjects). Second come nonrepresentational designs with pattern, the leading type being central design (made by 10 subjects).

Form. Among nonrepresentational products, by far the majority of products (12) fall in level VI. The largest number of representational designs (16) fall at level III, though 10 still are at level II. As to the shapes used most, the diamond and square tie for first place, with 23 per cent each.

Color. For nonrepresentational figures, the leading class is full color pattern repeating form (12 subjects)—double the number at the preceding age. For representational figures, the chief use of color (13) is partial use of color consistent with form.

The leading color used is blue (22 per cent of pieces used), with black second (19 per cent of pieces). As to color combinations, only 10 use merely three or fewer colors. Of these, 2 use all blue; 4 use red, white, and blue.

Naming. As far as the level of naming is concerned, by far the outstanding type is object named object (34), design named design coming next (23). As to the actual things named, design comes first with 11, car or train next with 5. Plane, rocket, scene, and person have 4 each.

Compactness. Class V leads, with 32 subjects—the most to date—falling in this category.

Number of pieces. The mean number of pieces used by boys at this age falls off sharply, from 34.6 at 11 years to 29 at 12 years. The median increases slightly, from 25.5 to 26.

Timing. There is a sharp decrease in time here. The mean drops from 12.38 minutes to 8:33; the median from 12:00 to 6:30.

Symmetry. As to symmetry of placement, this is one of the low points. Only 8 subjects place their products symmetrically. As to symmetry of product, this is one of the more, though not the most, symmetric ages, with 18 subjects making symmetric products.

QUALITATIVE

GIRLS

As with the Rorschach test, individuality factors seem, at this age, to be playing a stronger part than do age factors, and thus central trends are somewhat difficult to define. The most conspicuous age characteristic is that, after the breakup and flying apart of Eleven, products seem to be coming back together again, though in different ways, according to the individuality of the maker. Except for slabs, there are fewer allover designs now, though they are stronger at 12 than they will be at 13. Also, there are many fewer scattered single designs, and those which do occur are better patterned, even though they do not arrive at a single total pattern.

Another conspicuous change between 11 and 12 years gives, once again, nonrepresentational designs with pattern leading over representational designs. Thus there are 17 good central designs (almost double the number at 11) and 5 slabs.* Objects decline from 16 to 11. A general impression is that the products are now of considerably better form than earlier, neater and better balanced, especially central designs. The subjects seem to handle the pieces more effectively than at 11, and the products look more massed and less separate.

There is a tendency toward somewhat shapeless perseveration—some subjects just build on and on. Also, girls' products, though no longer separate and scattered, have a marked tendency toward being large and spread out. At least 23 products of girls cover nearly the whole board. (See Plate 13.)

BOYS

As with girls, individual differences seem to be more conspicuous than central group or age trends. As a group, even as with individual subjects in other situations, 12-year-olds almost give the impression of not knowing *where* they are.

The most clear-cut central trend is that 25 of our 12-year-old boys make representational objects. The majority of these (24 per cent of all products made) represent some kind of vehicle or projectile—rocket, car, train, or boat—and some of the people are somewhat projectile in form. Faces occur here, and at 13 and 14, more than at any other ages in this range.

There are almost twice as many representational products as nonrepresentational designs with pattern. Conspicuous among these nonrepresentational designs are well-balanced circular figures, diamond-shaped masses made of diamonds, and "grip-tooth" central designs.

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* Slabs may be more characteristic of Twelve than the present population indicates. In a different population of 12-year-olds, in one day 6 out of 16 subjects tested made slabs.

Boys make more slabs (6) here than at any other age, and the slab pattern strikingly fits with some of the characteristics which we consider descriptive of the 12-year-old personality (Gesell, Ilg, and Ames, 1956): it is vigorous, colorful, multiple, sprawling, and relatively shapeless.

The importance of centers is noteworthy, and the probably different implications of a "bright" red center and an "empty" white one are interesting.

There is much question, with some subjects, as to when to stop or how long they are supposed to go on. Some just drift on and on. There is also considerable movement, expressed or implied, in the products.

DEVELOPMENTAL TABLE

BELOW AGE

Any nonpatterned nonrepresentational design except slabs
Edge designs
Frame-and-center design
Small separate objects or designs

AT AGE

* Slabs, most pieces fitting on all sides
Scenes, though fewer
* Any good object or design, especially single central designs
* Whole pattern filling tray
Some perseveration—subjects build on and on
* Vehicles and projectiles (boys)

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* Most highly characteristic items.

SEX DIFFERENCES

Type of design. The differences here are in the usual direction but are, perhaps, more marked than at any age in the 10- to 16-year range. The leading type of design in girls is nonrepresentational with pattern, and girls make more of these than do boys (25/15). They especially lead in central design (17/10). The leading type of design in boys is representational, and they make more of these than do girls (18/29). Boys, especially, make more objects than do girls (11/25). Girls, as usual, have more scenes (7/4).

Form. For nonrepresentational patterns, boys are more fully at level VI than are girls. For representational patterns, girls are a little more advanced in form than are boys. As to the actual shapes used, in girls, diamonds are used most, then scalenes; in boys, diamonds and squares tie for first place.

Color. In nonrepresentational patterns, relatively more boys fall into the category full color pattern repeating form than do girls, though this category leads in both. Girls are ahead in the use of color in representational patterns. Blue is the leading color in both, but, for girls, black, green, and red tie for second place; for boys, black comes second.

Naming. Girls name designs most (12); boys name objects (24). Girls exceed in animal (5/1), scene (7/4), and flower (3/1). Boys exceed in airplane or rocket (0/4), car or train (0/5), boat (1/3), and face (1/3).

Compactness. The products of boys and of girls are about equally compact.

Number of pieces. Girls use definitely more pieces than do boys, the mean being 34.5 versus 29; the median 30.5 as against 26.

Timing. Girls' timing is much longer than that of boys. The mean is 11:35 for girls, 8:33 for boys; the median is 9:30 for girls and 6:30 for boys.

Symmetry. Girls' products are slightly more symmetric than are those of boys: 21 girls and 18 boys make symmetric products.

ACCOMPANYING OR CHARACTERISTIC BEHAVIOR INCLUDING VERBALIZATION

Typical of Twelves, particularly of the superior 12-year-old, is a definite pertness on the part of girls, an air of banter on the part of boys. Most show considerable enthusiasm about the whole situation.

In general, 12-year-olds work rather quickly and effectively (even when, as often, they make slab patterns), as contrasted with Elevens' fumbling, spilling, and indecision, even though some Twelves don't seem to know when to stop. Several ask if the pieces have to fit perfectly. The subject's attitude and approach may actually be more confident and sure than the actual product warrants.

Typical of 12-year-old girls' comments are, "I remember it was hard. . . . What is it supposed to show? That I'm intelligent? Too difficult for my brains. . . . Wait a minute!"; or, "What's the object of this anyway? It's awfully interesting."

At more length, a typical verbalization is:

> What can I build? Think I'll build something that won't give you any idea of what I'm like. . . . At the end I'm going to make you guess what I'm making. . . . I get so tired of the same thing every year—I want something new and exciting. Oh, this is a better idea. Don't think you'll ever guess this. . . . Can you get enough of an idea from this? What is it? Don't know if I picked the exact center in this. No, a bit off. Lots of things I could correct in this if I had a free hand. . . . Do you charge Mummy for me coming in here and making these things? . . . I think it would be fun to make up an entirely new problem for the scientists that they would have to work on 24 hours a day. I could scream and scream and say, "My mother hates me and I hate her." Poor Mummy. I think it would be fun to have a nervous breakdown. I think it would be fun to have psychologists always pestering me: "What did you eat for breakfast? Why did you eat it?"

Typical of boys are such remarks as the following:

> I can't think of anything to do with it. Made a tank once and a house once. Make a car but you haven't got the right kind of things. Gotta be white. . . . Doesn't look so good, does it? Oh well! Too hard to make a convertible. No, not too hard to make a convertible cause you don't have to put a top on it. . . . Generosity killed a cat. Nothing half that size is there? . . . It's beginning to look more like a plane. [Examiner says maybe it is a plane.] It isn't a plane! . . . You *would* criticize me, would you? You should have some of these smaller and darker and lighter so I could have foreground and background. . . . Doesn't look much like a plane does it? [Examiner says it looks like a submarine.] Insultingly wrong! . . . Oh, terrible mistake! Have to start all over! No, just kidding. . . . Gorgeous plane! But it has to have an aerial. Oh you rat!" [to ex.] Not big enough, is it? Is it? Who asked your opinion? . . . Have to take the whole tail off. I don't get bored. Just careless. You can't recognize a master mind at first. . . . Look, I've got to do the whole thing over just because you thought it was a gorgeous specimen! Gotta do the whole thing over just because I made a stupid little mistake. . . . Too much slanted, isn't it? [Examiner says, "Not bad."] Who asked your opinion of the matter? Gotta go home and do my homework. You mean thing!

Some 12-year-olds laugh and groan as they approach the task and as they work, but nevertheless with evident enjoyment. A few ask the purpose of the test: "What do these tests show?"; or "Seems silly, but I guess there is a purpose to it."

There are many enthusiastic, individual comments: "Ah hah! The inspiration is now coming!"; or "Wish I had a set of these. They're fun!"

ILLUSTRATIONS

(SEE PLATE 13)

Girls: a) Central design
b) Object: flowers
c) Scene: horse and grass

Boys: d) Object: jet plane
e) Central design
f) Slab

CHAPTER 20

Thirteen Years

	G	B	All		G	B	All		G	B	Al
A. Nonrepresentational without pattern				B. Nonrepresentational with pattern				C. Representational			
4. Slab Large	7	1	8	2. Central design	20	17	37	Object	12	19	31
5. Over-all	1	0	1	3. Design along rim	0	2	2	Scene	6	10	16
				4. Fills tray Whole pattern	1	1	2				
				5. Separate designs	3	0	3				
All A	8	1	9	All B	24	20	44	All C	18	29	47

QUANTITATIVE

GIRLS

Type of design. The leading classification here is nonrepresentational with pattern (24), the leading single class being central design (20). The second leading classification is representational, with object the leading single class (12).

Form. Among nonrepresentational productions, the largest number (13) fall at level VI, with 10 at level V. This is just slightly less accurate than productions at 12 years of age. Among representational products, the largest number (10) are at level III, but 7 are only at level II. This is, again, slightly less accuracy of form than at 12 years. As to the shapes used most, the diamond leads (30 per cent of all pieces) and the scalene comes second (24 per cent).

Color. For nonrepresentational products, full color pattern repeating form (11 subjects) and partial use of color consistent with form (10 subjects) are nearly equal. This is a little less mature than at 12 years. For representational products, naturalistic use of color (10 subjects) definitely leads.

As to the actual colors used most, black and red tie for first place (each 18.5 per cent of pieces used). As to color combinations, 15 girls now use only three or fewer colors. Of these, 1 uses all blue; 2 use all black; 3 use black, white, and yellow; 2 use black and yellow; and 2 use red, white, and blue.

Naming. As far as the level of naming is concerned, design named design leads, with 14 subjects at this level; object named object comes next with 12. As to the specific things named, design leads (14), then scene (5), and flower (4).

Compactness. By far the largest number of responses (19) now fall at level V.

Number of pieces. More pieces are used than at 12 years (there is an increase in the mean from 34.5 to 36.3), though the median drops from 30.5 to 28.

Timing. The time is shorter than at 12 years. The mean drops from 11:35 to 10:25 minutes, the median from 9:30 to 8:30.

Symmetry. As to placement on the paper, this is one of the less symmetric ages, only 9 products being symmetrically placed. As to the product itself, 19 can now be classed as symmetric.

BOYS

Type of design. The leading classification here is representational (29 subjects), with the leading single class being objects (19). The second leading classification is nonrepresentational design with pattern, and, of these, the leading single class is central design (17 subjects).

Form. Among nonrepresentational products, the largest number (15) fall at level VI, with only 3 at level V. This is a little more accurate than at 12 years. Among representational products, 15 are at level III and 11 still are at level II, just slightly less accurate than at 12 years. As to the shapes used, the diamond and square tie for first place (24 per cent of pieces used, for each).

Color. For nonrepresentational products, full color pattern (12 subjects) definitely leads. For representational use of color, partial color pattern with no relation to form leads. This is less mature than at 12 years.

As to the actual colors used, blue clearly leads (25 per cent of pieces used), with black next. As to color combinations, 15 boys use only three or even fewer colors. There are 1 all blue; 1 all black; 2 black and yellow; 2 blue and white; 2 red, white, and blue; and 2 red, white, black, and blue.

Naming. Object named object leads for the level of naming, with 14 boys at that level. Design named design comes next with 11. For specific things named, design leads (10), then scene (10), then train (5), then abstract, person, and face (4 each).

Compactness. By far the majority (32 products) fall at level V, the most compact productions to date except for 12 years.

Number of pieces. There is an increase in the number of pieces over 12 years. The mean increases from 29 to 30.8; the median from 26 to 28.50.

Timing. There is an increase in timing. The mean increases from 8:33 to 11:48 minutes; the median from 6:30 to 9:00.

Symmetry. As to placement on the paper, this is one of the less symmetric ages, with only 10 products placed symmetrically. As to the figure itself, there is a slight increase over 12 years, 21 products now being symmetric.

QUALITATIVE

GIRLS

At 11 years it seemed that products were flying apart. At 12, they tended to consolidate. Now at 13 there is a real pulling in toward the center. There is a tremendous increase in central designs, especially circular designs, at the expense of spread-out over-all designs. Though slabs remain strong, there are virtually no whole patterns, separate designs, or unpatterned over-all designs. Of the 50 patterns made by girls, 20—more than at any other age—are central designs. The tendency is for them to be compact (this is the low point in the age period from 10 to 16 years for separate designs), or sharp outlines, and there is a conspicuous use of black, black and yellow, or black, yellow, and white. (See Plate 14.) There are no frame-and-item patterns, and only 4 subjects place pieces along the edge.

Of these central patterns, 4 are hollow-centered circles or empty-centered designs with 1 piece set in the center, and 3 are sharp, black, asymmetric outlines. Both of these types of pattern we consider highly characteristic of 13.* There are 2 diamonds made of diamonds. The patterns seemed better organized, more highly successful at 12 than at 11 years, and the improvement continues here.

The compactness of Thirteens seems to us to represent the climax of an introversive tendency toward pulling in and compactness in central designs, which begin to open out more in the year which follows.

This is a low point for scenes (a spread-out type of product), there being fewer scenes here than at any age since 5 years. This is the last strong age for slabs, there being 7 in girls. There is no marked central tendency in the type of objects made, which include 4 flowers, 3 trees, and 4 animals.

Black, blue, and red are used most by numerical count, but this is also the high point for the use of yellow.

BOYS

Although the pulling-in tendency observed in girls is also observable in boys (6 boys make the hollow-centered blue circle which we consider so characteristic of 13), there is a marked difference between the products of the two sexes. The products of boys tend to be more effectively patterned than do those of girls. The girls still have 8 nonrepresentational designs without pattern (last conspicuous age for these), whereas boys have only 1. Girls have 7 slabs, boys only 1.

Boys, on the other hand, have 19 objects, as opposed to 12 made by girls, and 10 scenes, as opposed to 6 made by girls. It is at this age and at 14 that more boys than girls make scenes. This is a low point for scattered designs.

In general, except for the 6 hollow-centered circles, the products of boys seem to be more diversified and more spread out than those of girls. Though blue designs with empty white centers are characteristic, several make a design of white pieces surrounding a center of blue, the characteristic pattern in reverse. Blue, black, and green are the leading colors used.

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* Girls, perhaps, show the pulling-in tendency of 13 a little more clearly than do boys.

Content, as noted earlier, is extremely different in the two sexes, girls making trees and flowers most; boys making house (3), person or face (8), and plane, train, boat, or abstract design most.

There is a move in the direction of abstraction in boys (less conspicuous in girls). Not only are there 4 abstractions, but a number of boys are content, instead of trying to make objects which resemble objects named, to let 1 or 2 chips *stand for* the thing named. Thus a single square may represent a football player, a scalene may represent a baseball player, a triangle may be a pyramid, or two diamonds may stand for a spaceship. This gives the scenes a sketchy, abstract appearance. Even when several pieces are combined, as to make a tugboat or a car, it is the general outline more than the detail which is emphasized.

Vehicles and projectiles have, for some time, been prominent in the responses of boys, but here we see, in the scenes representing sports and in the 5 cars or trains, a reflection of two of the predominant interests of teen-age boys.

Although age trends are clearly discernible in both boys and girls at this time, many children have already settled into what appears to be a characteristic teen-age pattern for them, and they repeat this same figure with only very slight variation from year to year.

DEVELOPMENTAL TABLE

BELOW AGE

Any nonpatterned nonrepresentational design except slabs
Edge designs
Frame-and-center design
Small separate objects or designs

AT AGE

* Hollow-centered circles
* Dark-colored, sharp, angular, asymmetric designs or objects
* Use of black and yellow, or dark colors
Slabs; fit less good than at 12 years
Scenes: vehicles, sports (boys); fewer in girls
* Any successful object or design
* Abstractions
* Use of a single chip to represent a person or object

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* Most highly characteristic items.

SEX DIFFERENCES

Type of design. As at 12 years, the leading type of design in girls is nonrepresentational, there being almost twice as many nonrepresentational as representational

(32 nonrepresentational, 18 representational). Of these, 24 are nonrepresentational with pattern, and of those, 20 are central designs. In boys, representational designs lead (21 nonrepresentational to 29 representational). As usual, boys make more representational designs than do girls.

Girls have more central designs (20/17), more nonrepresentational designs without pattern (8/1), especially more slabs (7/1), but, for the first time, boys have more scenes than do girls (6/10). Boys also have more objects (12/19), as at all ages from 10 to 16 years.

Form. For nonrepresentational patterns, boys' form is a little better than girls'. In representational patterns, boys' form is also a little more advanced than is girls'. As to the actual shapes used, girls use diamonds most, then scalenes; boys use diamonds and squares equally.

Color. In nonrepresentational patterns, boys are ahead of girls in the use of color. In representational patterns, girls are far ahead in the effective use of color. Girls use black and red most; boys use blue most, then black.

Naming. As to the level of naming, in girls, design leads; in boys, object. As to the specific items named, girls exceed in tree (3/2) and flower (4/0). Boys exceed in house (1/3), person and face (3/8), scene (5/10), plane and rocket (0/3), train (1/5), boat (0/3), abstract (2/4), and car (1/5).

Number of pieces. Girls use more pieces than boys. The mean is 36.3 for girls, 30.8 for boys, though there is a lower median in girls.

Timing. Boys take longer to complete their products. The mean is 10:25 minutes for girls, 11:48 for boys; the median is 8:30 for girls, 9:00 for boys.

Symmetry. Girls and boys both are low in symmetry of placement on the paper, but about even as to symmetry of the product. Girls make 19 symmetric products, whereas boys make 21.

Girls make more of the spiky black-and-yellow designs which we consider characteristic of this age. Boys produce more of the hollow-centered circles which we also consider characteristic of the age.

ACCOMPANYING OR CHARACTERISTIC BEHAVIOR INCLUDING VERBALIZATION

Compared to the performance at 12, a Thirteen tends to make smaller, neater, better-organized products, and his whole attitude as he works is quieter, more reserved, less positive, and less enthusiastic than it was a year earlier. Many neither talk nor smile much as they work, but merely listen to the instructions and then proceed to work in silence. In general, the subjects at this age may be described as less sure of themselves, less enthusiastic, less positive in their attitude toward the test than they were at 12 years.

There are, in general, among those who *do* verbalize, many negative and critical comments: "I don't see any sense in this!"; or "I hate blue!"; or "Whole thing's cockeyed!"

There is quite a lot of complaint about "No room"; "No space"; "Doesn't fit";

"Can't think of anything to make." Some actually state that it seems harder this year: "I'm trying to think of something to make. Usually, it's so easy."

There are a few rather personal comments, but many of these tend to be of a negative nature: "Not balanced but then, neither am I"; or "I have no imagination. I'll tell you that much"; or "I'll probably prove to be abnormal"; or, "Be a guinea pig. You'll probably find out that I'm a nitwit."

Some comment apologetically, on viewing their finished product, "I tried."

An occasional child, who at 12 has made a bright, many-colored product, may at this age start out with several colors and then, sweeping pieces aside, offer some apology and use merely blue or blue and white. In fact, with several there occurs an almost perseverative trial and error; that is, they start to make one thing, then change to another and another.

As at other ages, quite a number, when asked what they have made, say, "Not anything," or, deprecatingly, "Just a design." More noticeable than at many other ages is the number of subjects who work entirely or almost entirely unilaterally.

ILLUSTRATIONS

(SEE PLATES 14, 15)

Girls: a) Central design
b) Central design
c) Central design
d) Object: flower
e) Object: flower
f) Slab

Boys: a) Central design
b) Central design
c) Central design
d) Object: man
e) Object: model-T truck
f) Scene: football game

CHAPTER 21

Fourteen Years

	G	*B*	*All*		*G*	*B*	*All*		*G*	*B*	*All*
A. Nonrepresentational without pattern				B. Nonrepresentational with pattern				C. Representational			
3. Slab Large	2	0	2	2. Central design	19	20	39	1. Object	13	15	28
4. Over-all	1	1	2	4. Fills tray Whole pattern	2	1	3	2. Scene	10	11	21
				5. Separate designs	3	2	5				
All A	3	1	4	All B	24	23	47	All C	23	26	49

QUANTITATIVE

GIRLS

Type of design. The leading classification now is nonrepresentational with design (24), with 19 central patterns. A second classification, representational, occurs nearly equally, with 23 subjects. The leading class here is object (13).

Form. Among nonrepresentational productions, by far the largest number (17) fall in class VI. This is the most accurate age to date. Among representational products, the largest number (13) fall at level III. As to the shapes most used, the diamond and scalene tie for first place, with 25 per cent of all pieces used being of each of these shapes.

Color. For nonrepresentational products, there is a marked advance in use of color over 13 years. Full color pattern repeating form definitely leads, occurring in 15 of the girls. As to representational use of color, naturalistic use of color—color pattern adding significance to form—leads (12 subjects).

As to the colors used most, the leading one is white, with 22.5 per cent of pieces. Second comes blue (18.5 per cent of pieces). With regard to color combinations, 18 girls—the most to date—use only three or fewer colors. Of these, 1 uses all white; 3 use green and two other colors; 3 use black and yellow; 2 use red, white, and blue; and 2 use black, yellow, and one other color.

Naming. As far as the level of naming is concerned, design named design leads (14), with object named object next (12). As to the things actually named, design leads (14), scene comes next (10), person next (5), and flower next (3).

Compactness. The products are slightly more compact than at 13 years. The majority (26) fall at level V, although a conspicuous number (14) are still only at level III.

Number of pieces. Considerably more pieces per child are used at 14 than at 13. The mean increases from 36.3 to 38.2; the median from 28 to 37.5.

Timing. The mean time per subject remains the same as at 13 years—10:2 minutes. The median time has increased from 8:30 minutes to 10:00.

Symmetry. As to placement on the paper, this is the most symmetric age since 9 years, 12 subjects now placing their products symmetrically on the paper. As to symmetry of product, *this is the most symmetric age of the entire range* (24 subjects).

BOYS

Type of design. In boys, the leading classification is representational (26 subjects), with the leading class objects (15). The classification nonrepresentational with pattern, however, nearly equals representational, there being 23 products here, with 20 single figures.

Form. Among nonrepresentational productions, nearly all (17) now fall in class VI. Among representational, the largest number (14) fall in class III. As to the shapes used, the largest precentage of pieces (25) are small triangles; the next are squares (21 per cent).

Color. For nonrepresentational products, full color pattern repeating form (12 subjects) leads. As to representational figures, full color pattern repeating form leads (8 subjects), with naturalistic use of color (7 subjects) coming second.

As to the colors used most, blue leads (22 per cent of pieces used), with black and green tied for second place (17 per cent each). With regard to color combinations, only 10 boys use three or fewer colors. Of these, 1 uses all blue; 2 use green and one other color.

Naming. As far as the level of naming goes, design named design and object named object tie for first place, with 15 each. As to the actual things named, design leads (15), with scene second (11), then person, other building, and tree tied with 4 each.

Compactness. Products are somewhat less compact than at 13 years. The largest number (26) do fall at level V, but 14 are still at level IV, and 6 are at level III.

Number of pieces. Considerably more pieces are used per subject than at 13 years. The mean rises from 30.89 to 33.34; the median from 26.00 to 28.50.

Timing. Boys' timing is shorter than at 13 years. The mean has dropped from 11:48 minutes per child to 9:17; the median has increased from 9:00 to 9:30.

Symmetry. As to placement on the paper, this is the most symmetric age since 9 years, 12 subjects placing their products symmetrically on the paper. As to the product itself, *this is the most symmetric age of the entire age range,* with 26 boys making symmetric products.

QUALITATIVE

GIRLS

Conspicuous is the similarity in performance of the two sexes, which is perhaps more striking at this age than at any other. Outstanding in both is the marked symmetry of products. In girls, 16 of the 19 central designs are extremely symmetric, and even many of the objects, such as persons, trees, and flowers, are also made very symmetrically.

Patterned nonrepresentational designs still predominate (though just barely), there being 24 patterned nonrepresentational designs and 23 representational. This near tie results from a virtual disappearance of slabs and other nonpatterned designs, and from a marked increase in scenes, which are again strong as at 10 years, and as they will be at 15 and 16 years. In fact, this is a high point for scenes, and they are becoming attractive and graphic, though some are more suggestive than accurate. Thus, patterned central designs predominate, and unpatterned nonrepresentational designs, especially slabs, occur least of any age in the 10- to 16-year zone.

The marked symmetry of central designs, mentioned above, extends to both shape and color in many cases, and in 7 designs, the top and bottom as well as the two sides match. Balance, however, may be effected by having two pieces of the same shape but of different colors, or of different shapes but the same color.

There are 10 scenes, 5 persons and 1 face, 4 trees, 3 flowers, and 5 buildings.

Central designs are beginning to open out again, after the extreme drawing-in seen at 13. Several of them are now spaced. Along with this trend toward separation and expansion, there are now 3 patterns made of small separate designs and 3 made of small separate objects. But even these begin to take on the look of a total design, the separate parts seeming somewhat related and balanced.

The use of colors is more varied, and the colors used are brighter than at 13 years. Several start to use black and then discard it for brighter colors.

BOYS

The products of the two sexes are strikingly similar at this age—more than at any other age here considered. As with girls, good symmetric central designs are conspicuous (15), and considerable symmetry is also noted in such objects as men and buildings. Boys seem to show this extreme symmetry at 14 a little more clearly than do girls.

Central designs are so prominent that, for the first time in boys, they nearly equal, in number, representational objects and scenes. Thus there are, in all, 23 nonrepresentational designs with pattern and 26 representational objects. Boys, for the first time, make slightly more central designs than do girls. In fact, the products of the two sexes not only look alike but fall into very nearly the same categories.

Representational designs (objects and scenes combined) occur more than any other category. The largest single *type* of product in boys is now central patterned nonrepresentational design (20). Of these, 15 are matching (form and often color as well) from side to side. At least 8 are symmetric all the way around. Scenes feature sports and action.

Sex differences as to the kinds of objects made are slight. The leading objects for boys are, except for scenes, building (6), person and face (7), vehicle (7), and tree (4).

Both boys and girls tend, in their central designs, to make a design which is jagged on the outside. Then they fill in the spaces so that the outer circumference is smooth. Then again they add separate pieces so that once more the outline is jagged. Any given subject may stop when the product is smooth or when it is jagged.

Now, even more than at 13, we note several subjects making the same pattern year after year. This is one of the reasons that, for some children, the Mosaic now reveals individuality as strongly, if not more strongly, than it reveals age.

DEVELOPMENTAL TABLE

BELOW AGE

Any nonpatterned, nonrepresentational designs, including slabs
Edge design
Frame-and-center design
Hollow-centered circles
Sharp, angular, asymmetric designs

AT AGE

* Symmetric central designs
* Any successful design or object
* Scene: action, sports, abstractions
Several separate designs
* Central design beginning to open out; that is, pieces are spaced
Use of bright colors
Design which, as constructed, is first smooth, then jagged, in its circumference

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* Most highly characteristic items.

SEX DIFFERENCES

Type of design. The behavior of the two sexes at this age is *remarkably similar*. In fact, seldom, in the Mosaic, do we get such similarity. For nonrepresentational patterns with design, there are 24 made by girls, 23 by boys. For representational patterns, there are 23 made by girls, 26 by boys. Girls make 19 central designs, and boys make 20. Girls make 10 scenes, and boys make 11. The pattern of central designs is also very similar—very symmetrical. Thus nonrepresentational designs with pattern lead in girls (24), with representational designs second (23). Representational leads in boys (26), with nonrepresentational second (23).

Form. In nonrepresentational designs, boys are a little more accurate in form than are girls. In representational designs, behavior is about equal in the two sexes. As to the actual shapes used, girls use diamonds and scalenes most; boys use small triangles and squares.

Color. In nonrepresentational designs, a few more girls than boys make full color pattern repeating form, though this category actually leads in both. As to representational figures, girls are slightly more advanced in their use of color. Girls use white most, blue next. Boys use blue first, black and green next. More girls have only three or fewer colors than do boys.

Naming. The behavior of the two sexes is very similar as to class of naming. Design and object nearly tie for first place in each. Things named, also, are very similar. Thus scenes are about equal (10/11). People are conspicuous in both (5/4), as are buildings (5/6) and trees (5/4). Girls have more flowers (3/1), and boys have more vehicles (1/7).

Compactness. The products are about equally compact for the two sexes.

Number of pieces. Girls use more pieces than do boys, though both have increased since 13 years. The means now are girls, 38.2 pieces; boys, 33.34. The medians are girls, 37.5; boys 32.

Timing. Boys' timing is about a minute shorter, both mean and median, than is girls'.

Symmetry. Symmetry is about equal. This is the most symmetric age of all, for both sexes.

ACCOMPANYING OR CHARACTERISTIC BEHAVIOR INCLUDING VERBALIZATION

Fourteens seem, in general, to have rather high standards for their own Mosaic productions. Many are slow in starting and proceed slowly and thoughtfully, apparently giving much thought to what they are going to make. Many seem to be extremely critical of their own work. This criticism seems to be more of their own abilities than of the examiner or of the test, though there is some of both. Some sarcasm is directed at self or product; some Fourteens express disgust at their own lack of ability.

There is much less interchange with the examiner of the bantering, slightly rude, variety than at 12 years of age. In fact, there is less of any kind of interchange with the examiner and more concentration on what they are making.

Remarks tend to be self-critical, and there is quite a bit of complaint because there are no round pieces, no long, thin pieces, or because colors are not shaded or are not subtle enough. There is good effort at accuracy, fit, and balance, Several comment that they prefer to work in some other medium, as in oils or in water colors. Several ask the examiner what he wants them to make, or comment that they don't want to make the same thing they made last year.

There is quite a bit of change of plan after starting; behavior is fluid, flexible, and changing. Thus at this age many make a design which is jagged on the outside, then fill in so that the outside circumference of their product is smooth, then once again add pointed pieces to produce a jagged edge.

Typical of exuberant, energetic Fourteens is the fact that many of them seem to be using too much of everything—too many pieces, shapes, and colors; too much energy; too many ideas. At the same time they seem to fear that they are going to run out of time, space, ideas, and pieces.

In most instances the products are better organized than they were at 12 and 13 years. In general, as already described, Fourteens' products are colorful and symmetrical. Pieces are often added in pairs. Some start out with products somewhat typical of a younger age, then weave this original structure into a more mature product. Several start to use black (more common at 15), then discard it and substitute brighter colors.

Characteristic comments include:

> I get so inspired, and then just these dull colors.
> Can't get any subtleties of tone. Oh it's hopeless.
> Oh pooh! Impossible! Disgusting!
> You don't have the right colors so I'm going to have to use black instead of brown.
> What does this show about my child psychology?
> What does this show? What do you know about me so far?

ILLUSTRATIONS

(SEE PLATE 16)

Girls: a) Central design	**Boys:** d) Central design
b) Object: person	e) Object: football player
c) Scene: mare grazing and black one jumping a fence	f) Scene: soccer field

CHAPTER 22

Fifteen Years

	G	B	All
A. Nonrepresentational without pattern			
3. Slab Large	2	2	4
4. Over-all	1	0	1
All A	3	2	5

	G	B	All
B. Nonrepresentational with pattern			
2. Central design	18	23	41
4. Fills tray Whole pattern	1	1	2
5. Separate designs	4	2	6
All B	23	26	49

	G	B	All
C. Representational			
1. Object	12	15	27
2. Scene	12	6	18
All C	24	21	45
D. Mixed, representational and nonrepresentational	0	1	1

QUANTITATIVE

GIRLS

Type of design. The leading classifications here are representational (24 subjects) and nonrepresentational with pattern (23). The leading subclasses under representational are object and scene, tied at 12 each. The leading nonrepresentational pattern is central design (18).

Form. Among nonrepresentational products, by far the largest number (17) fall at level VI. Among representational products, the largest number fall at level III, but there are more (6) at level IV than at any age to date. As to the actual shapes used, diamonds come first (30 per cent of pieces used) and scalenes second (28 per cent).

Color. For nonrepresentational products, full color pattern repeating form definitely comes first (17 products). For representational design, the leading classification is color pattern adding significance to form (13 subjects), with 11 of these being naturalistic patterns.

As to the actual colors used most, blue leads (22 per cent of pieces used), with red and black (19 per cent each) tied for second place. As to color combinations, the largest number to date (19) use only three or even fewer colors. Of these, 3 use blue and red only; 3 employ red and black; 3 use red, white, and blue; 1 uses red, black, and white; 1 uses black and yellow; and 1 uses black and green.

Naming. As far as the level of naming goes, by far the leading classification is design named design (18 subjects). As to the actual things named, design leads (18), scene comes second (12), and person next (11),* with 5 naming tree.

Compactness. The largest number of products (19) do fall at level V, but products are markedly less compact than at 14 years.

Number of pieces. Fewer pieces are used than at 14 years. The mean falls from 38.20 to 35.50 pieces; the median from 37.50 to 27.50.

Timing. The mean is about the same as at 14 years (10:20 minutes at 14; 10:30 at 15). The median time is less (10:00 minutes at 14; 8:00 minutes at 15).

Symmetry. As to placement on the paper, 12 girls, as at 14 years, place their products symmetrically. As to symmetry of the actual product, they are considerably less symmetric than a year earlier. Now only 19 girls make symmetric products.

BOYS

Type of design. For boys, there is a marked shift in the predominant type of design. For the first time since 3 years, nonrepresentational design with pattern leads (26 subjects), with central design (23) being the main subclass. Representational patterns come second, with 21 subjects making this type of pattern.

Form. Among nonrepresentational products, by far the largest number (17) fall at level VI. Among representational products, levels II and III are tied for first place. Thus the products are relatively less accurate than at 14 years. As to the actual shapes used, diamonds come first (26 per cent of pieces used) and squares second (23 per cent).

Color. For nonrepresentational patterns, full color pattern repeating form clearly comes first. For representational objects, the main color class is partial use of color (11 subjects), the leading type under this being partial use of color consistent with form (10 subjects). This is a less mature use of color than at 14 years.

As to the actual colors used, blue leads (27 per cent of pieces used), with red second (19 per cent of pieces). As to color combinations, 13 subjects use three colors only, or fewer. There are 2 who use all blue; 7 who use red, white, and blue only. Three use red, white, blue, and black.

Naming. As far as the level of naming goes, the leading classification is object named object (14). As to the actual things named, design comes first (11), then scene (6), then train and decoration or star tied at 5 each.

Compactness. The majority of products fall at level V. This is even more than a year earlier.

Number of pieces. Fewer pieces are used than at 14 years. The mean falls from 33.34 to 30.40; the median from 32 to 27.0.

---

* This is by far the high point for persons for the entire age range.

Timing. The time used to finish a product increases at 15 years. The mean increases from 9:17 minutes to 11:00; the median from 9:30 to 10:00.

Symmetry. A very small number of boys—only 8—place their products symmetrically on the paper. As to the actual product, this is one of the three highest ages for symmetry, 23 boys making symmetric products.

QUALITATIVE

GIRLS

Products are smaller, less symmetric, less compact, involve fewer colors, and give special emphasis to blue, red, and black at 15. For the first time since 11, representational patterns exceed nonrepresentational patterned designs. There are still 18 central patterned designs. These are characteristically asymmetric and, if they are symmetric, are increasingly open and spaced.

As Plate 17 shows, outstandingly characteristic of Fifteens (and these characteristics are seen a little more clearly in girls than in boys) are the asymmetric, one-sided, off-center, fluid qualities of pattern, the neurotic-looking patterns, the use of dark colors and whirling designs, and the strong use of scalenes in a spiky way. Black is used conspicuously and effectively by those who employ it.

Interestingly enough, some of the scenes closely resemble some products which are called merely "design."

A few designs and a few men are symmetric, but these are now in the minority. There are a few large, complex, solid designs, strongly reminiscent of Nines. Outstanding as to content are scene (12), person (11), tree (5), and grass, sky, and flower (3 each). This large incidence of persons, by far the most of any age, is probably significant as indicating the strong concern of the 15-year-old about his own self and about the selves of others.

Note that the concepts are somewhat larger than earlier: "sailing regatta," "fox hunt," "basketball game," "abstract picture of India."

Outstanding, however, is the off-center appearance which is obviously intentional and is effectively carried out. Tree trunks, lamp bases, etc., tend to be at an angle instead of vertical. Several subjects make a short vertical column of black diamonds placed end to end. This may be part of an object or design or may stand alone.

BOYS

In contrast to girls, boys make more central designs at 15 than at 14. Not only are patterned central designs (23) the leading single item, but, for the first time since 3 years in boys, nonrepresentational designs with pattern exceed representational designs. There are 26 nonrepresentational designs with pattern and only 21 representational objects and scenes.

Patterns of boys are extremely varied—much more variable than the products of girls—and are also much more symmetric than are those of girls. In fact, boys make nearly as many symmetric designs as they did at 14. Conspicuous are whirling, clamp-shaped, and hollow-centered designs.

There are 4 abstract designs and 5 in the category "decoration or star" (which are also somewhat abstract). There are 5 trains but only 2 planes or rockets. Blue and red only and combinations of blue and red with other colors are conspicuous. A relatively large number (13) use only three colors or fewer. Fewer pieces are used than at 14 years, though a few subjects make very large, solid central designs resembling those seen at 9 years.

Both objects and designs tend to feature points. Several subjects build from the top downward.

DEVELOPMENTAL TABLE

BELOW AGE

Any nonpatterned, nonrepresentational design, including slabs
Edge design
Frame-and-center design

AT AGE

Symmetric central designs†
* Any successful design or object
Scenes, especially comprehensive concepts such as sailing regatta, fox hunt, abstract picture of India; typical adolescent outdoor scenes; sports (boys)
Separate designs
* Asymmetric, dark-colored products, especially featuring red and black
* Whirling designs
* Strong use of scalenes (girls)
* Large, solid complex designs as at 9 years
* Representational objects strong in girls; nonrepresentational in boys
Strong incidence of persons (girls)

---

* Most highly characteristic items.

† Most characteristic of 14 and 16, these also occur conspicuously at 15.

SEX DIFFERENCES

Type of design. A major change is taking place here. This is the first age since 3 years at which boys have more patterned nonrepresentational designs than do girls (23/26). Also it is the first age since 3 at which boys have more patterned nonrepresentational than representational designs. Conversely, it is the first age at which girls have more representational designs than do boys (24/21). Also in contrast to other ages, boys have more central designs than do girls (18/23).

Form. As to nonrepresentational products, girls are slightly more accurate than are boys. As to representational products also, girls are more accurate. As to the specific shapes used, girls use diamonds most, then scalenes; boys use diamonds, then squares.

Color. For nonrepresentational products, full color pattern repeating form leads in both, though in girls a little more so than in boys. For representational products, girls are definitely ahead of boys. Girls' products fall chiefly in class V; boys in class II. As to the colors used, both use blue most. In girls, black and red come second; in boys, red.

Naming. Girls name design most and boys name object, as to level of naming. As to the specific things named, girls have many more persons than do boys (11/3), more scenes (12/6), more grass (3/0), trees (5/2), and flowers (3/0). Boys have more abstracts (0/2) and more decoration-star designs, etc. (2/5), more buildings (2/5), and more trains (0/5).

Compactness. Boys' products are considerably more compact than are girls'.

Number of pieces. Girls use more pieces than do boys. The mean is 35.5 for girls; 30.4 for boys. The median for girls is 27.5; for boys, 27.0.

Timing. Boys' products take slightly longer to complete than do girls'.

Symmetry. More girls than boys place their products symmetrically on the paper. Fewer girls than boys make symmetric products.

Boys make more small blue patterns than do girls. Boys' scenes are more patterned and systematic, having less to do with nature. Boys' designs seem larger, more solid, and rounder than those of girls. Slabs, in general, seem to be opening up, and more so in girls than in boys. Boys make more buildings; girls make more growing things.

ACCOMPANYING OR CHARACTERISTIC BEHAVIOR INCLUDING VERBALIZATION

At this age the Mosaic test seems to bring out many negative remarks at the beginning, middle, and end of the production. Also, there are negative remarks addressed personally to the examiner. Some subjects, on the other hand, make absolutely no conversation with the examiner. Many work with just one hand, as if divorcing themselves as much as possible from the situation.

Typical negative introductory remarks include the following:

As I remember, this never came out right. Very discouraging.
Never can make heads or tail out of this thing.
How can you make anything with these things?
I feel silly.
Just going round and round with the color.
Just fooling around.
This makes me feel like I'm a nut or something.
I feel foolish playing this game.
Sometimes I think this gets harder every year.

What? *That* again!
Can't make much of anything.

Complaints as they work include such comments as:

How much longer do I have to go on?
These aren't too cooperative. They're not the right size.
I bet these don't fit. Nope they don't fit.
I just can't make it do what I want. This is just about the stupidest thing I ever did.

Several say they don't know what it is, and then, as they work, suddenly it turns into something (almost in spite of them).

Concluding remarks also tend to be extremely negative:

Evil mess.
Not even a design.
Nothing.
Absolutely nothing.
I don't know what there is to tell.
Doesn't look like a sailboat at all. An absolute insult. I'm not satisfied with it but I guess I'll let it go at that.
Guess that's a sad excuse for a person.
As you can see, I didn't do a very good job in design.
I don't know what it is. I just went round and round.
No meaning whatever.

A few subjects make rude, unfriendly remarks to the examiner: "Oh you're the one with the Boston accent. I hate a Boston accent." Subjects are quick to slap the examiner down for any unguarded remark. Thus if the examiner comments, "Oh that's the handle?" the subject may reply coldly, "Is it?"

Some, as earlier, ask what this test proves, but now they ask the question with a rather hostile air and not with the enthusiastic, inquisitive interest which they expressed earlier. Several say that they have made nothing.

ILLUSTRATIONS

(SEE PLATE 17)

Girls:
- a) Central design
- b) Central design
- c) Scene: basketball game

Boys:
- d) Central design
- e) Central design
- f) Object: Arrow

CHAPTER 23

Sixteen Years

	G	B	All		G	B	All		G	B	All
A. Nonrepresentational without pattern				B. Nonrepresentational with pattern				C. Representational			
4. Over-all	5	0	5	2. Central design	15	25	40	1. Object	10	17	27
				4. Fills tray Whole pattern	1	1	2	2. Scene	16	5	21
				5. Separate designs	2	2	4	All C	26	22	48
								D. Mixed, representational and nonrepresentational	1	0	1
All A	5	0	5	All B	18	28	46				

QUANTITATIVE

GIRLS

Type of design. The leading classification here is clearly representational design (26 girls), with scene (16) the leading subclass. There are, however, 15 central designs.

Form. Among nonrepresentational products, the largest number (but fewer than at any age since 13 years) fall at level VI. Thus form level is less advanced than at other teen ages. Among representational products, the largest number (14) fall at level III, but 7 subjects—the most at any age to date—make products at level IV. As to the actual shapes used most, diamonds lead (30 per cent of pieces used), with scalenes coming second (28 per cent).

Color. For nonrepresentational products, nearly all products (16) fall at level IV—full color pattern repeating form. Representational products are varied, but the largest number (12) are at the level of color pattern adding significance to form, naturalistic. As to the actual colors used, black and white tie for first place, with 20 per cent of pieces used of each. As to color combinations, there is more variety than at 14 and 15 years. Only 13 girls use three or fewer colors. Of these, 3 use red, white, and blue; 2 use blue and white; 2 use all black; 2 use green and one other color; 2 use green and two other colors.

Naming. As to the level of naming, scene named scene leads (16 girls), and design named design comes next (14). As the actual things named, scene leads (16), design comes second (15), and other building is next (10). Then come grass (7), sky (7), tree (7), person (6), animal (4), and boat (4).

Compactness. There is less compactness here than at any age since 7 years. Only 16 products now fall at level V of compactness.

Number of pieces. There are somewhat more pieces used here than at 15 years. The mean increases from 35.5 to 36.10; the median jumps from 27.5 to 35.

Timing. Though girls use more pieces than they did at 15, their timing is shorter. The mean drops from 10:30 minutes per subject to 8:45; the median falls from 8:47 to 6:30 minutes.

Symmetry. As to symmetry of placement on the paper, 11 girls place their products symmetrically—about the same number as at 15 years. As to the actual product, there are fewer symmetric ones (only 15) than at 15 years.

BOYS

Type of design. The leading classification here is nonrepresentational with pattern (28), with central design (25) the leading subclass. Representational design comes second (22 subjects), with 17 of these being objects.

Form. Among nonrepresentational products, the largest number fall at level VI (17). Thus accuracy of form remains just about the same as at 15 years. For representational products, the largest number lie at level III, but this is one of the three outstanding ages for products falling at level IV. As to the actual shapes used, the largest number (24 per cent of all pieces used) are diamonds, with the small triangle coming second (23 per cent of pieces).

Color. For nonrepresentational products, the largest number (12) fall at level IV—full color pattern repeating form. For representational designs, the use of color is varied. The most (8) fall at full color pattern repeating form; the next most (7) are at level V—color pattern adding significance to form, naturalistic use.

As to the colors used, blue comes first (29 per cent of all pieces used) and red is second (16 per cent). As to color combinations, 13 use three or fewer colors. Of these, 3 use blue and white; 3 use red, white, and blue; 2 use all blue; and 3 use green and two other colors.

Naming. As to the level of naming, design named design clearly leads (15 boys). As to the actual things named, design leads (16), and scene (5), abstract, and house (4 each) follow.

Compactness. Products are somewhat less compact than at 15 but are still predominantly compact, 26 products falling at level V.

Number of pieces. Boys use about the same number of pieces as at 15 years. The mean was 30.40 and now is 30.68. The median changes from 27.00 to 24.50.

Timing. Boys work more quickly than at 15 years. The mean falls off from 11:00 to 8:47 minutes per subject; the median drops from 10:00 to 6:00.

Symmetry. As to symmetry of placement, this is the most symmetric age to date, 15 boys placing their products symmetrically on the paper. As to symmetry of the product itself, this is one of the two most symmetric ages (though it is exceeded greatly at 14 years), with 18 subjects now making symmetric products.

QUALITATIVE

GIRLS

For the second age in sequence, and increasingly, representational products exceed nonrepresentational. The outstanding single kind of product is scenes, of which there are now 16. Scenes tend to be bright, colorful, and sometimes rather heavily massed, and emphasize trees, grass, and sky. Scenes are not only conspicuous at this age, but effective, and their concept is elaborating. Some are made of single pieces scattered very effectively. There is more variety of color here than just earlier; only 13 girls now use three or fewer colors.

Next to scenes in number are central designs (15). These are characteristically well balanced, either from side to side, from top to bottom, or both. There are still, however, some "failed" central designs. These designs tend to be opening out. There is some piling or overlapping of pieces, giving a somewhat shaded effect. Four subjects make what they call "abstractions."*

The most girls of any age (5) make over-all unpatterned designs, emphasizing the expansiveness and lightness of the age. Only 2 girls (both of somewhat neurotic temperament, as judged by their Rorschachs) make heavy, closely fitted, ugly-looking products. Many subjects, by 14, 15, or 16, do seem to come into their own and use pieces easily and effectively.

BOYS

Boys, for the second age in sequence, have more nonrepresentational than representational patterns, thus reversing their earlier position.† There are now 25 patterned central designs, and, as with girls, these tend to be somewhat loosely designed and are opening out.

For boys and girls together, there are 40 (out of 100) central designs. Boys make these more than do girls and thus appear to illustrate the age better than do girls.

Conspicuous are a well-balanced bridge and rockets. There are 8 vehicles, 4 abstracts, and 4 houses, but only 3 persons. Scenes have fallen off sharply in boys at both 15 and 16 years. There are now only 5 scenes made by boys.

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* Typical abstraction: "A church. The blue and red is where everybody combines and the rest, the ways you can go, like Protestant, Catholic, etc."

† As at 15 and continuing at 16, boys and girls have reversed their earlier relative positions. Now it is girls who have the more representational designs and boys who have the more nonrepresentational.

DEVELOPMENTAL TABLE

BELOW AGE

Any nonpatterned, nonrepresentational design except over-all design
Edge design
Frame-and-center design
Hollow-centered circles
Sharp, angular, asymmetric designs
Slabs

AT AGE

* Symmetric, spaced central designs
* Any successful designs or objects
* Scenes: bright, cheerful, massed; typical outdoor scenes—trees, flowers, grass, sky
* Strong use of representational designs in girls and nonrepresentational in boys
Variety of bright colors
* Abstracts, as "symbol of religion"
* Massing or overlapping of pieces to give a shaded effect
* Vehicles (boys)

---

* Most highly characteristic items.

SEX DIFFERENCES

Type of design. At 14 years, sex differences were very small. Here at 16 they are large. Girls now make more representational than nonrepresentational designs (26/22); boys make more nonrepresentational than representational (18/28).

Girls have, in many respects, returned to very much the same kind of pattern that they made at 10 years of age.* Boys make chiefly nonrepresentational designs, especially central designs. Thus we see a continuation and exaggeration of the reversal in type of design, a reversal started at 15 years, with girls making chiefly representational and boys nonrepresentational designs, contrary to the trend established from 11 through 14 years of age.

Form. Girls are less accurate in form level—nonrepresentational products—than are boys. Girls are less accurate than at 15 years, boys equally as accurate as at 15. For representational products, both make products chiefly at level III, with more than at most ages at level IV. As to the shapes used, girls use diamonds, then scalenes; boys use diamonds, then small triangles.

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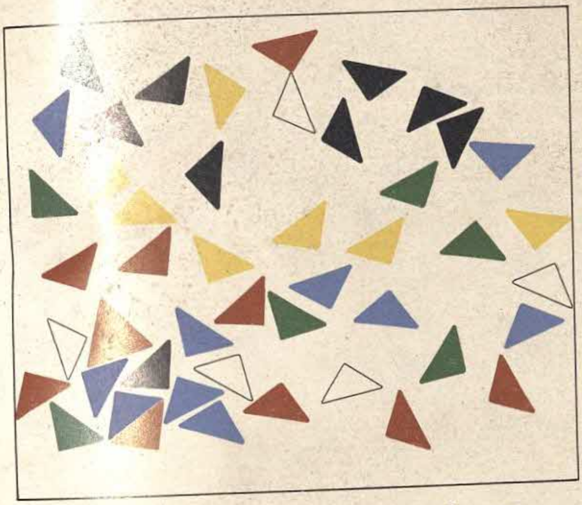
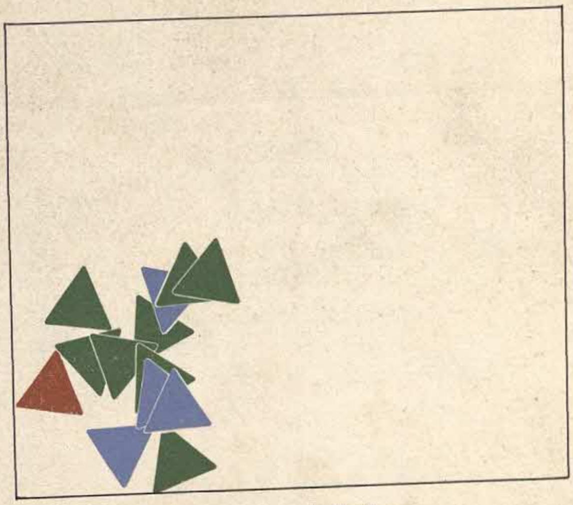
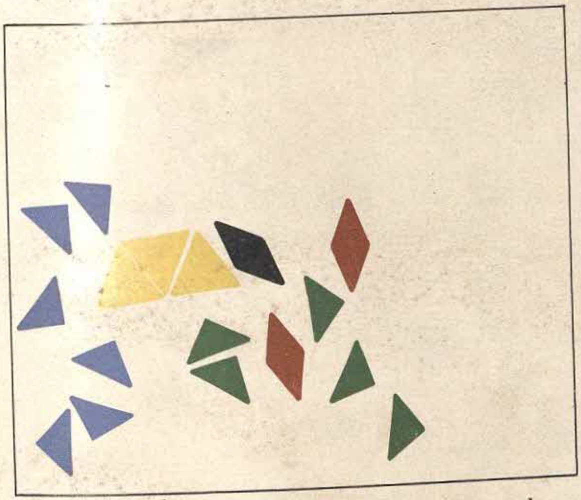
* This same marked similarity between products at 10 and 16 years has been seen also in an earlier study, *Adolescent Rorschach Responses* (Ames *et al.,* 1959).



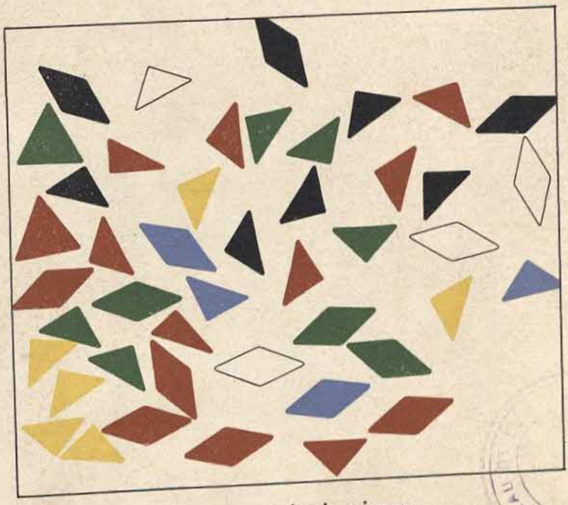
a) Girl D. C. Scattered single pieces: house.



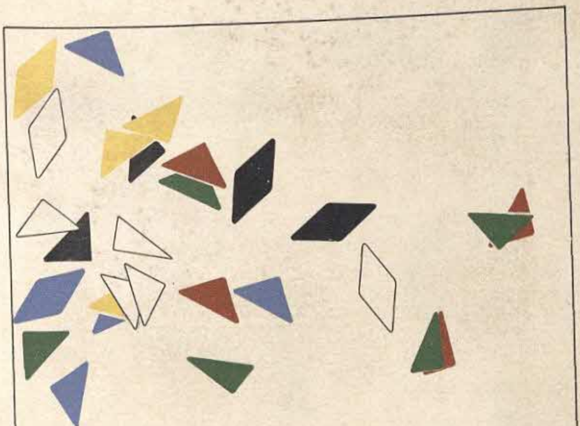
b) Girl J. R. Scattered and piled.



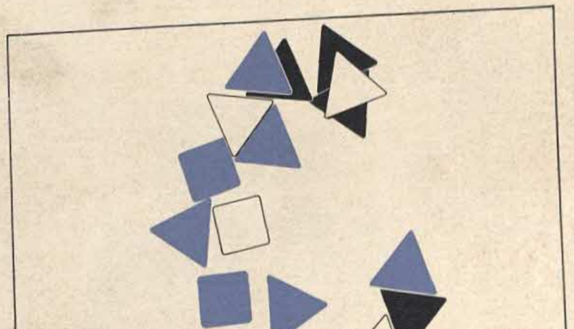
c) Girl P. H. Scattered or placed at random (prefundamental).



d) Boy S. H. Scattered single pieces.



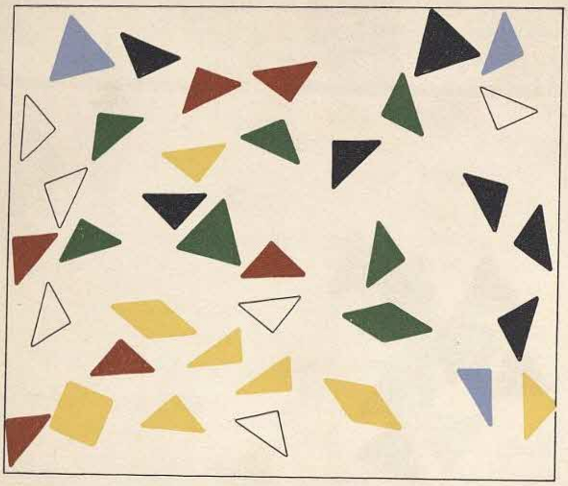
e) Boy D. R. Scattered and piled.



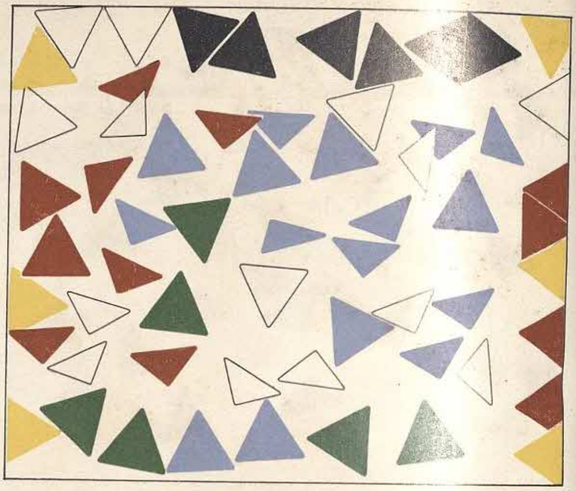
f) Boy M. B. Scattered or piled at random (prefundamental): big circle, two steam engines.

PLATE 1

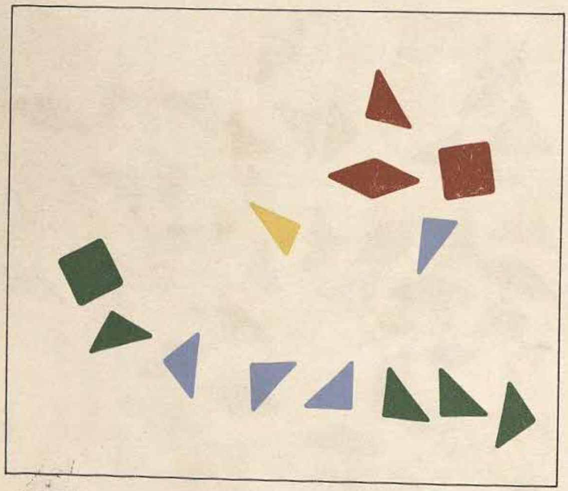
Two years



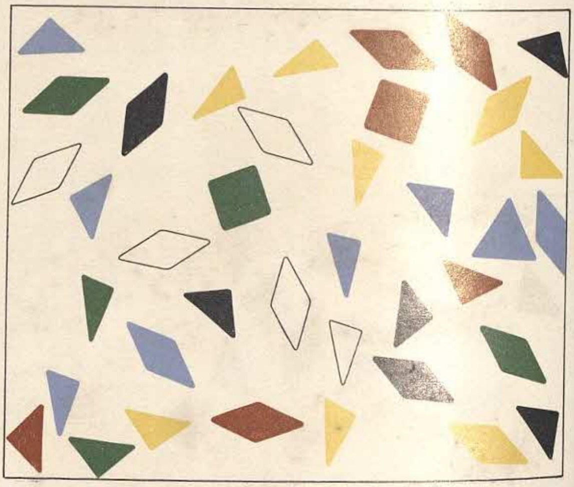
a) Girl J. B. Scattered or placed, single pieces.



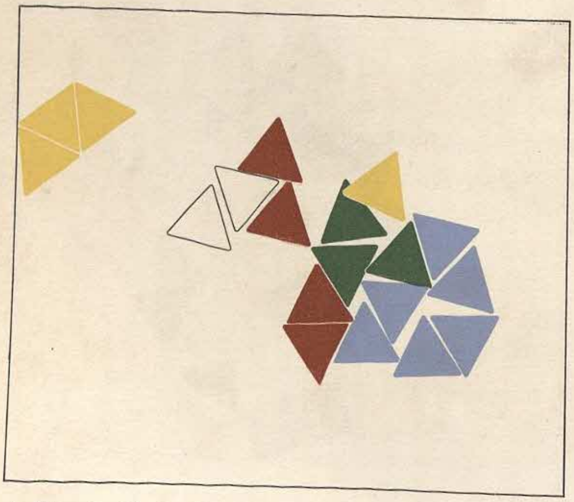
b) Girl B. B. Prefundamental.



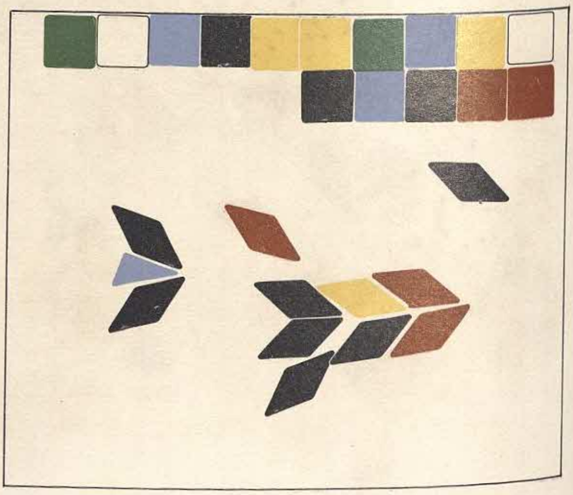
c) Girl C. R. Pieces placed singly: house, chimney.



d) Boy B. B. Pieces scattered singly: cars.



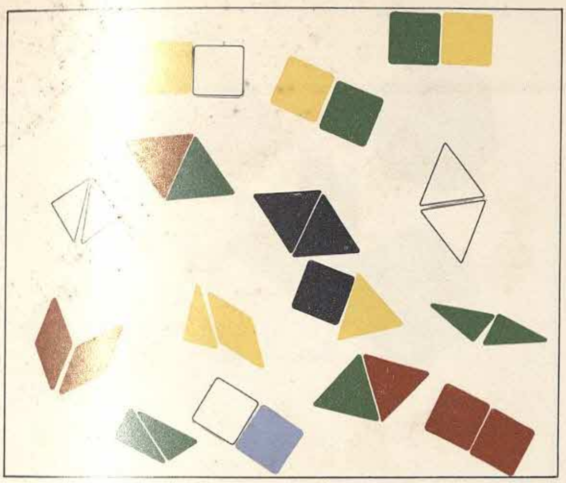
e) Boy B. G. Prefundamental.



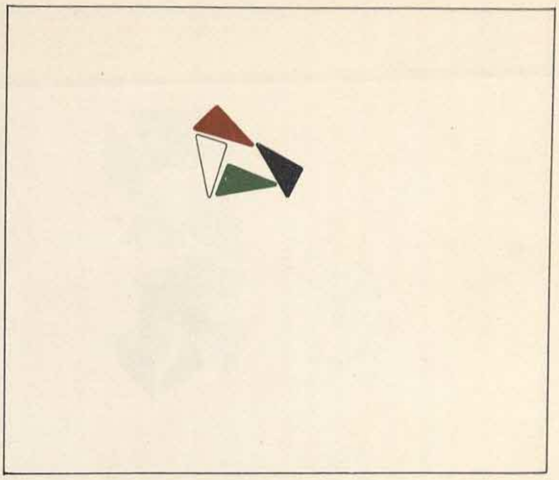
f) Boy W. P. Objects: choo-choo train, airplanes.

PLATE 2

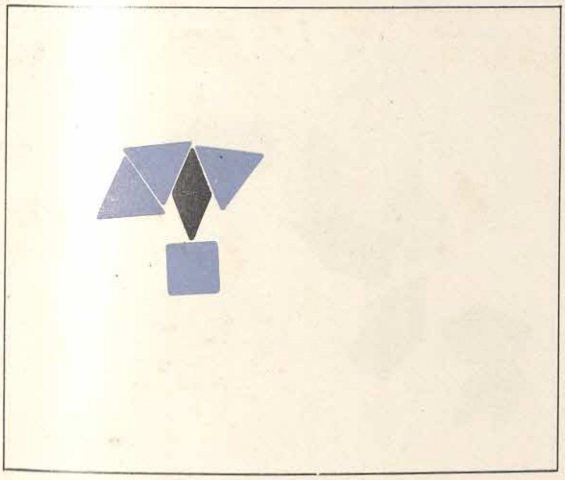
Three years



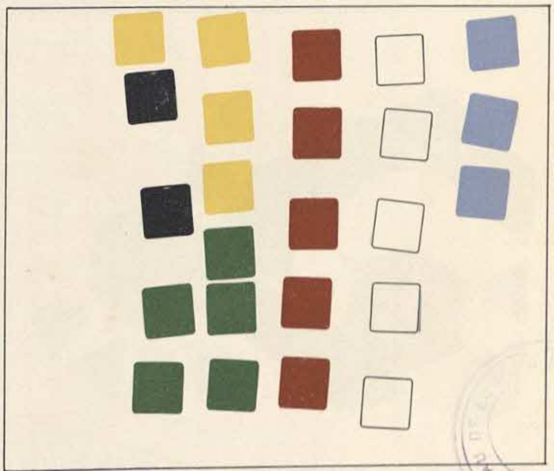
a) Girl D. F. Prefundamental: cupcake, clown, ice-cream cone.



b) Girl J. A. Central design: red, white, black, green.

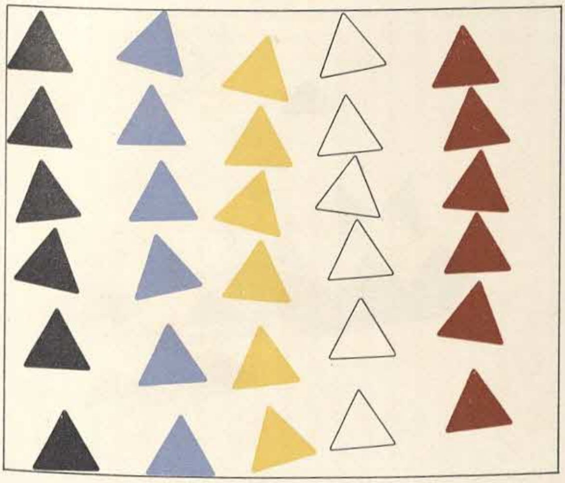


c) Girl L. F. Central design: design.

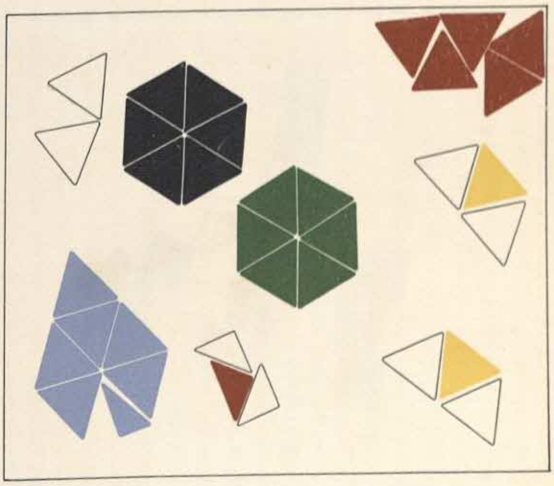


d) Girl A. B. Central design: design.

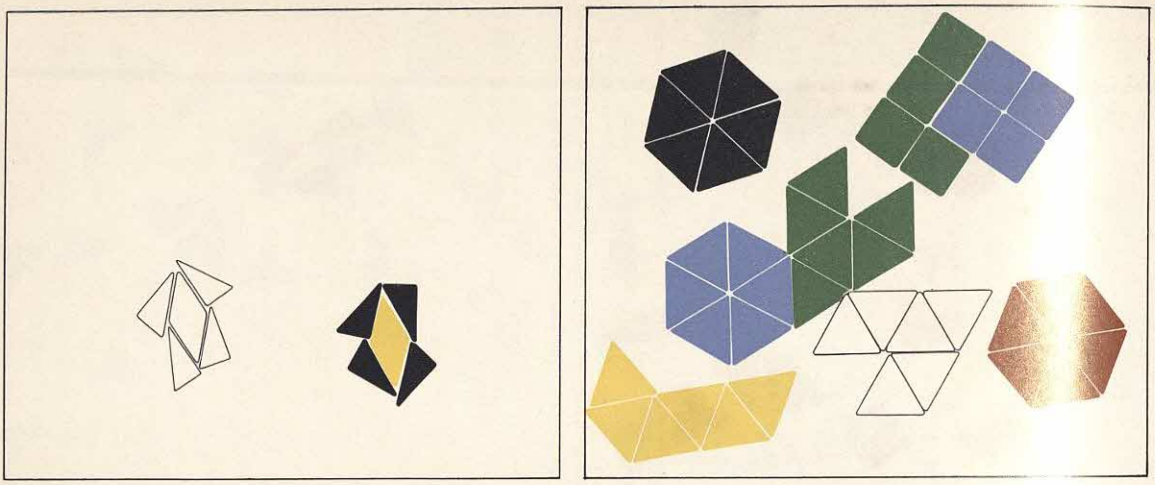
BUREAU



e) Girl K. D. Design filling tray: a tree.

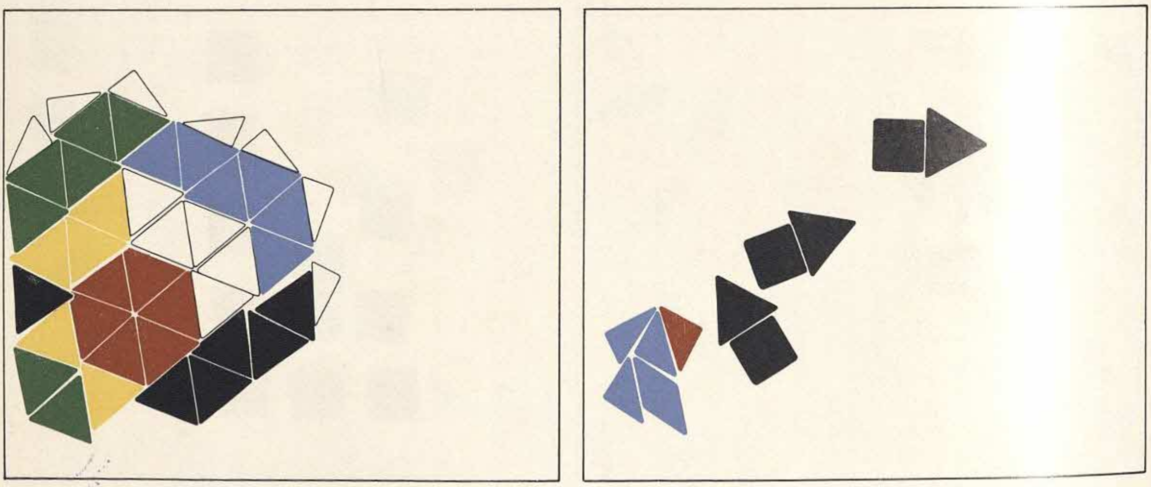


f) Girl J. O. Basic 4-year-old circle: two bracelets, butterfly.



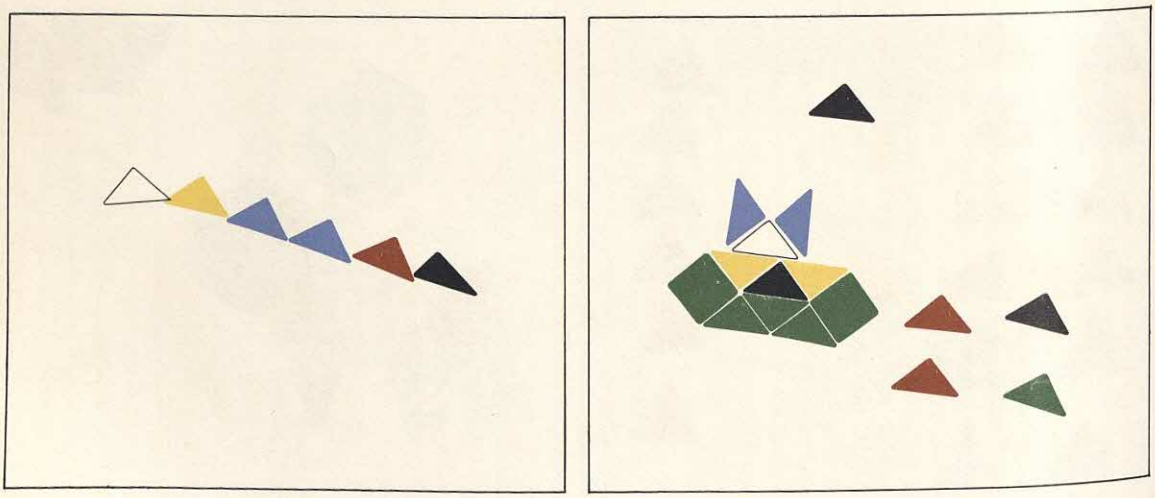
a) Boy C. H. Central design: design.

b) Boy B. H. Objects: windmill, farmhouse.



c) Boy P. G. Object: dredge furnace.

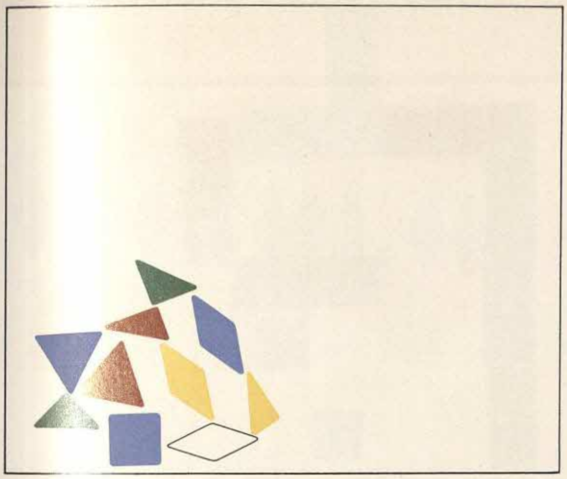
d) Boy B. H. Object: airplane.



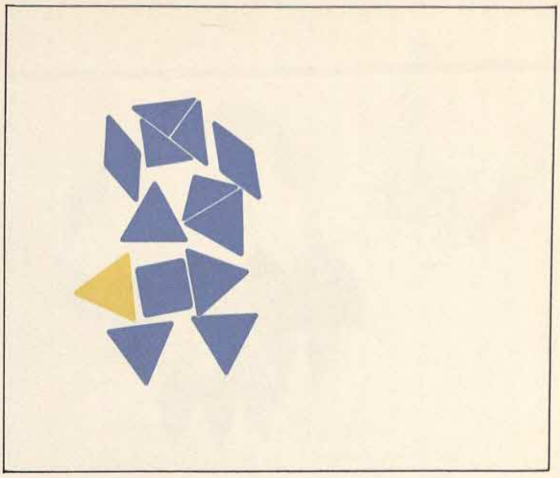
e) Boy K. C. Object: train.

f) Boy T. B. Scene: boat, sun, rock.

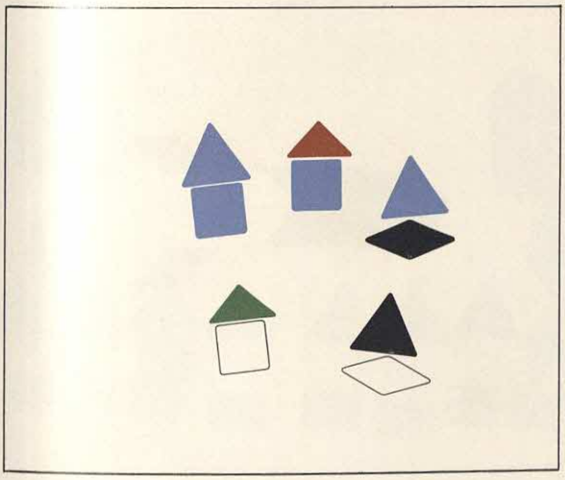
PLATE 4 *Four years—boys*



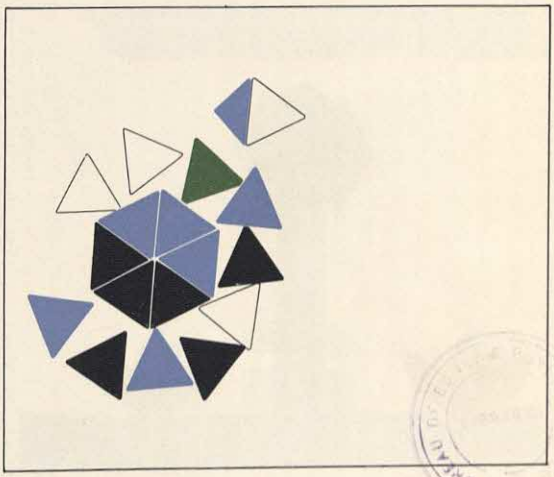
a) Girl M. H. Central design: design.



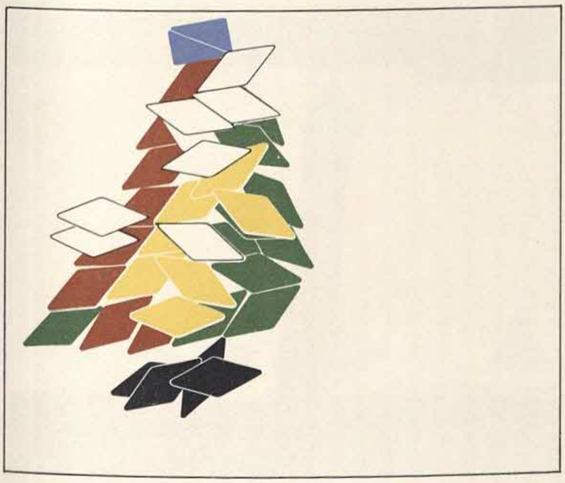
b) Girl C. S. Object: girl.



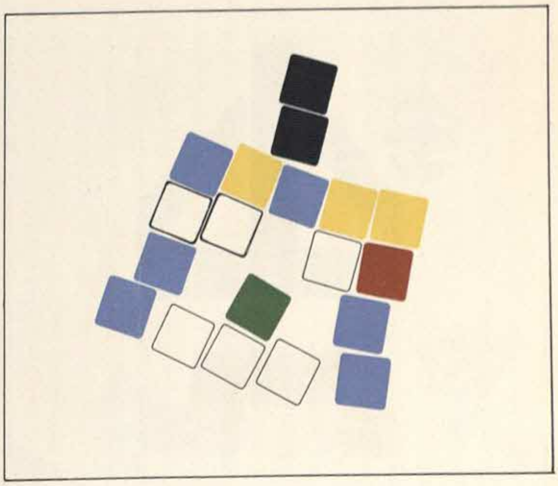
c) Girl J. L. Scene: houses, house and tower, farmhouse, sidewalk and tower.



d) Boy P. E. Design and object: kite, design.



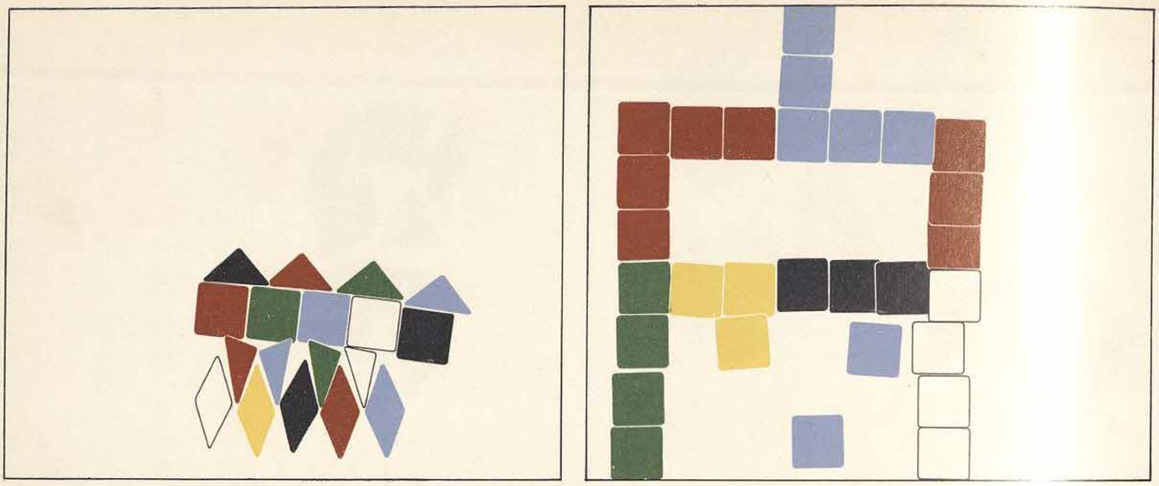
e) Boy R. S. Object: Christmas tree.



f) Boy G. N. Object: house.

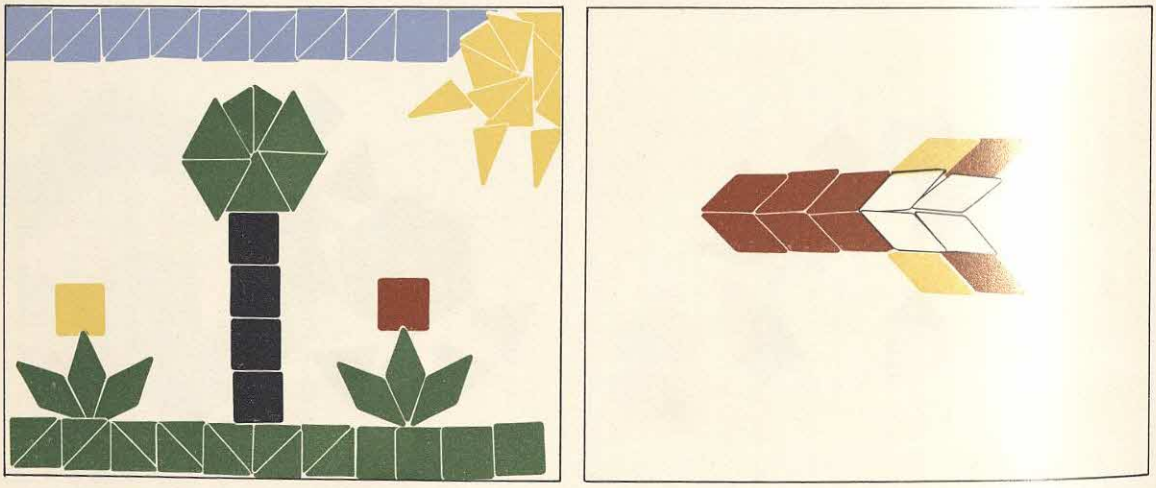
Five years

PLATE 5



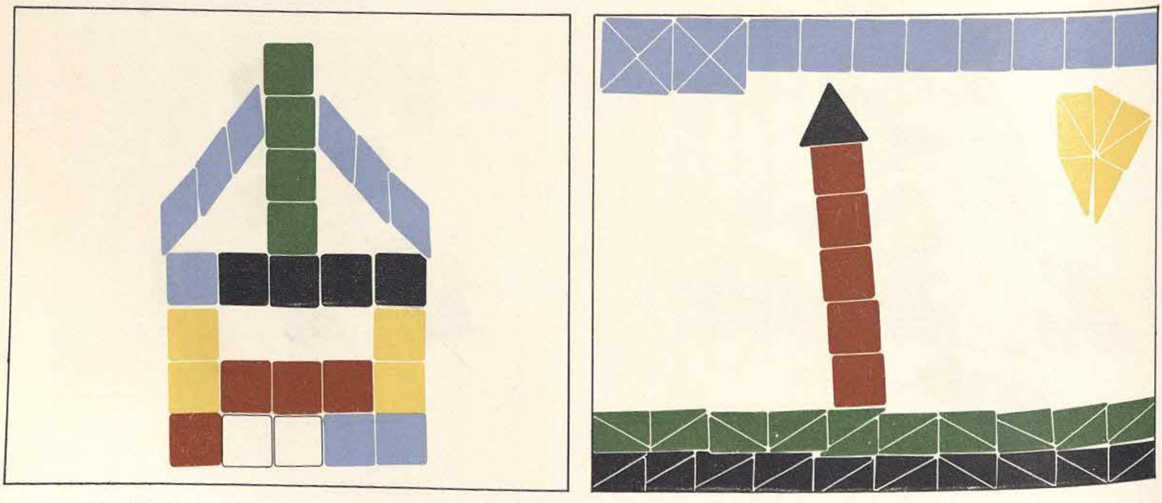
a) Girl M. S. Central design: design.

b) Girl J. C. Object: house.



c) Girl P. B. Scene: grass, flowers, tree, sky, sun.

d) Boy L. B. Object: arrow.

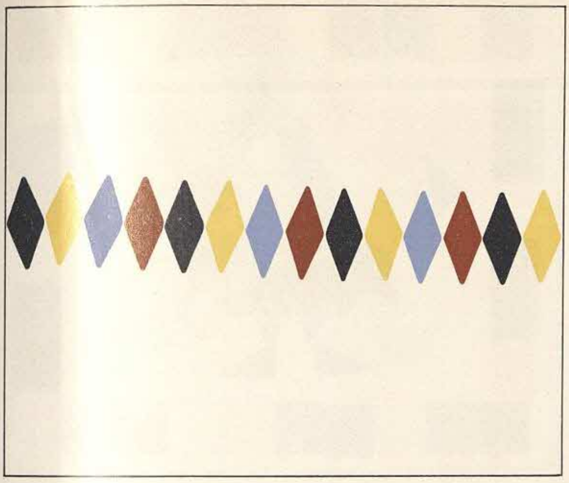


e) Boy W. V. E. Object: house.

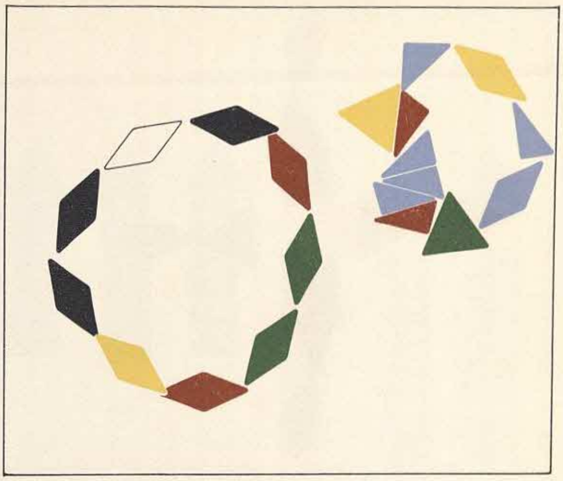
f) Boy J. L. Scene: house, dirt, grass, sky, sun.

PLATE 6

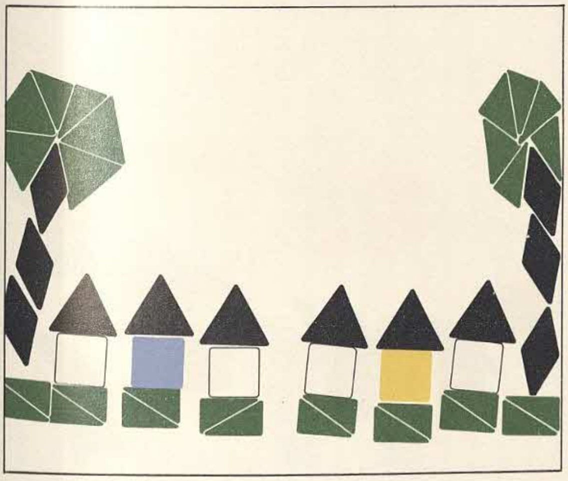
Six years



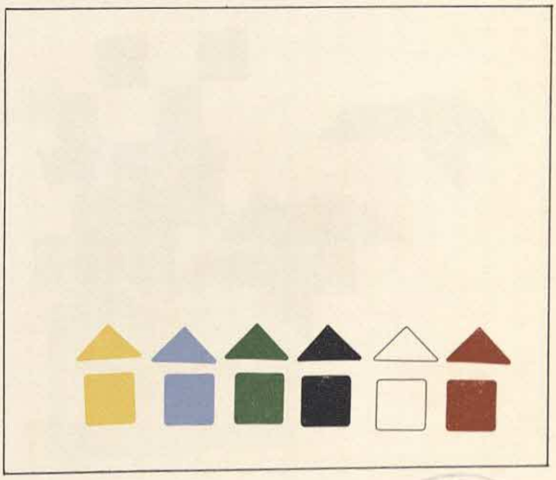
a) Girl J. A. Linear design.



b) Girl T. D. Separate designs: designs.



c) Girl U. G. Scene: village.



d) Boy M. R. Linear design.

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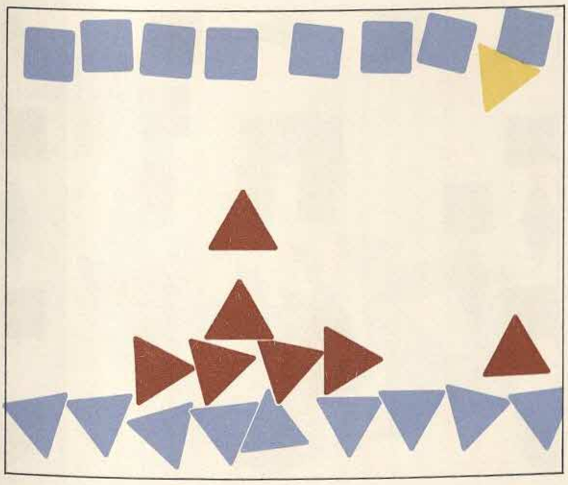
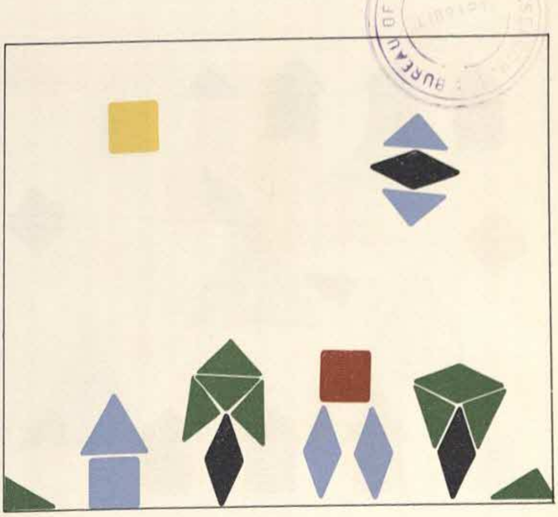
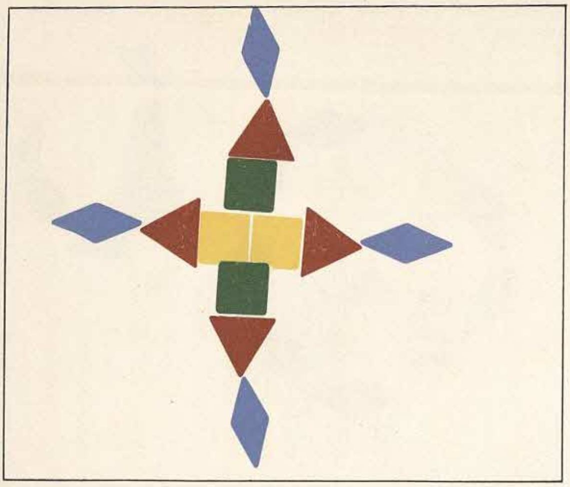


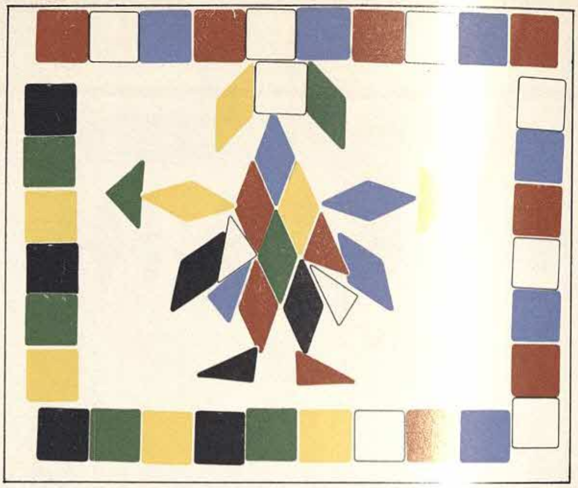
e) Boy J. K. Scene: sailboat, rowboat, water, sun, sky.



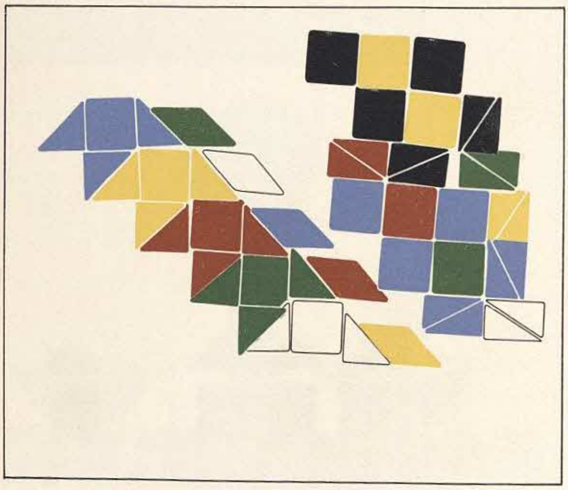
f) Boy W. S. Scene: house, trees, hills, airplane.



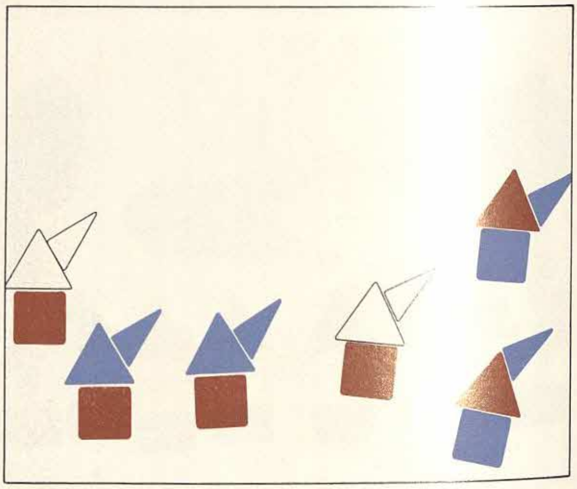
a) Girl K. H. Central design: design.



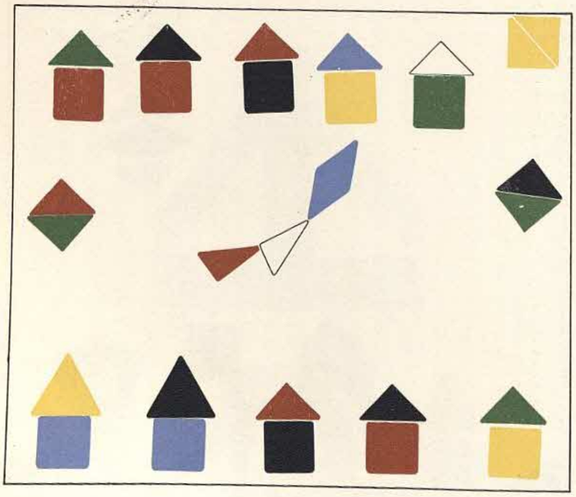
b) Girl M. C. Frame and item: person and frame.



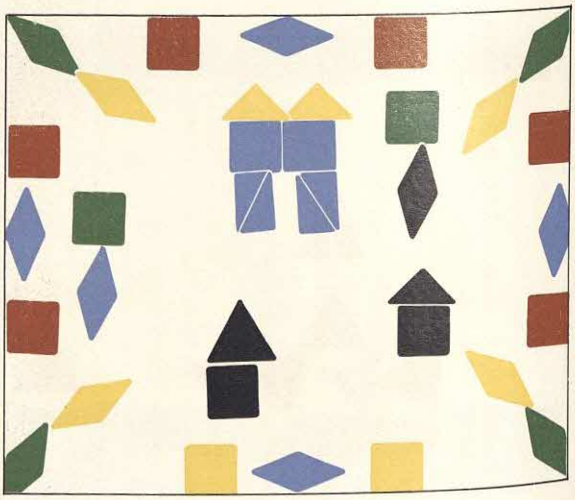
c) Girl J. L. Central design: design.



d) Girl W. C. Scene: houses.

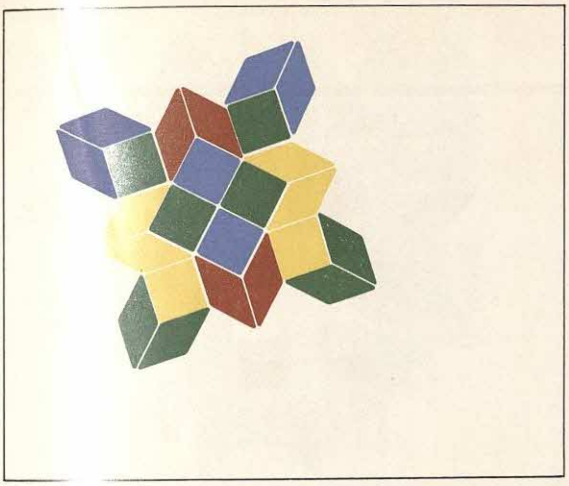


e) Girl K. T. Scene: houses, two boats, kite.

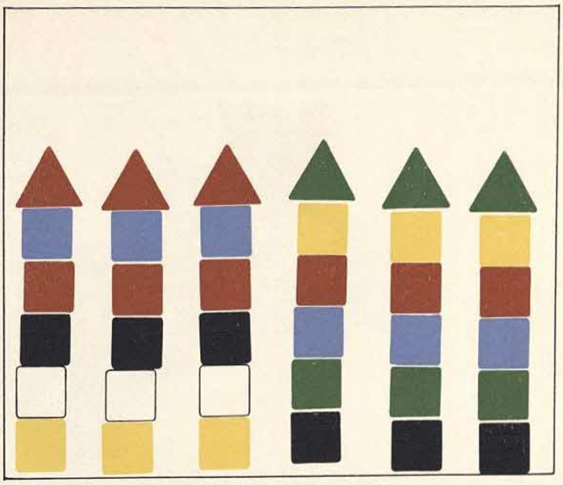


f) Girl M. B. Scene: village.

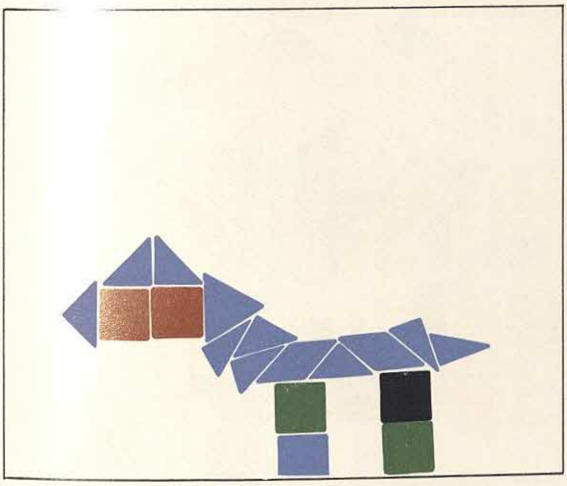
PLATE 8 *Eight years—girls*



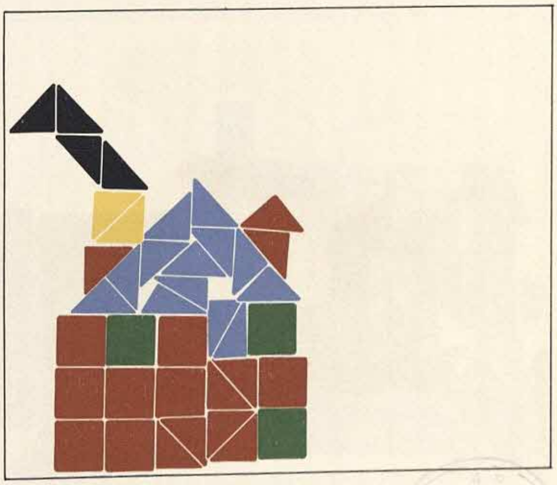
a) Boy J. B. Central design: design.



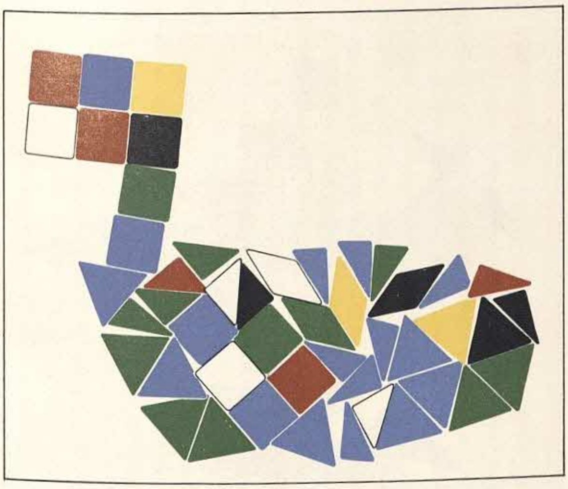
b) Boy L. B. Object: rockets.



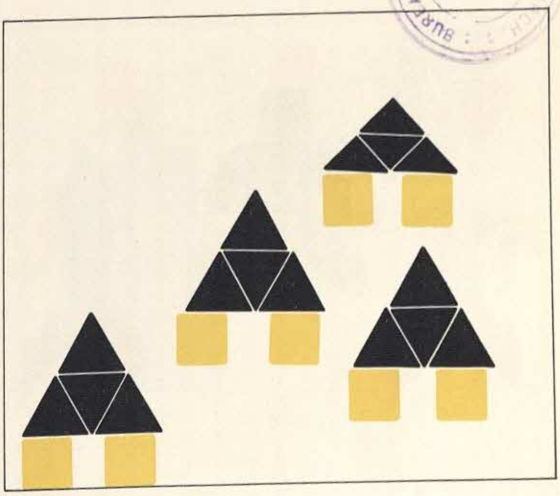
c) Boy S. A. Object: horse.



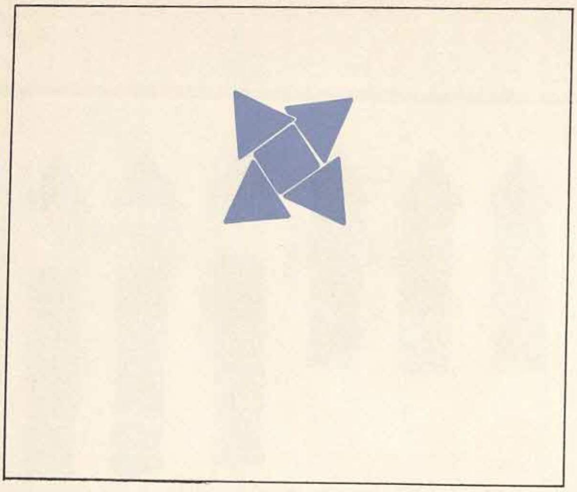
d) Boy G. B. Object: house.



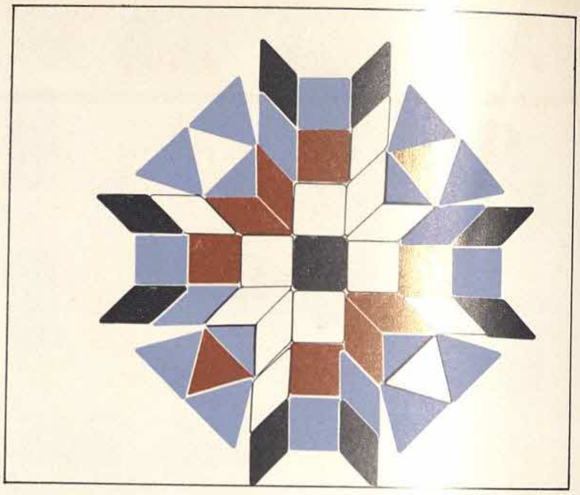
e) Boy B. C. Object: boat.



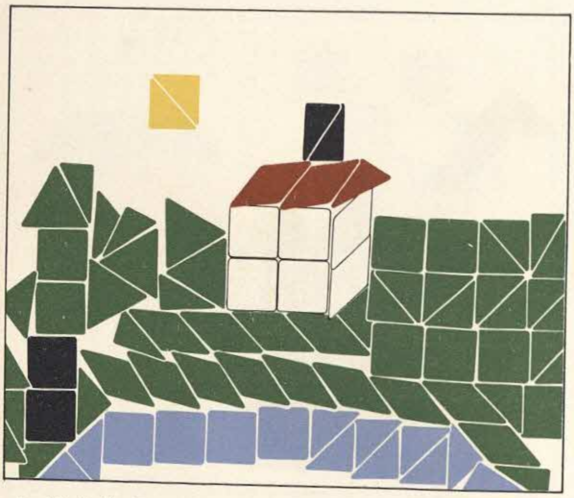
f) Boy T. A. Scene: summer scene—bridgehead, pyramids.



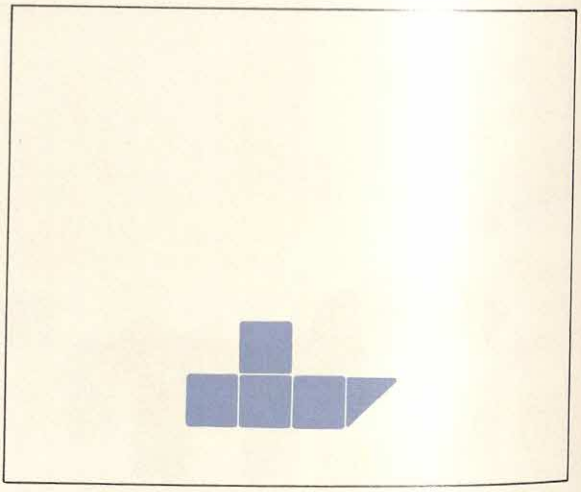
a) Girl S. F. Central design: star.



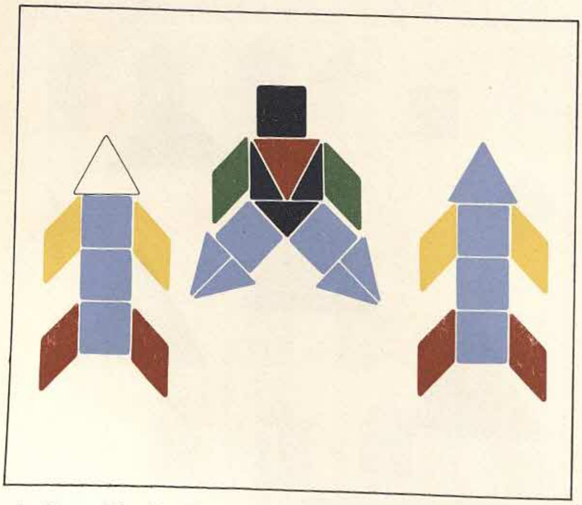
b) Girl D. L. Central design: desi



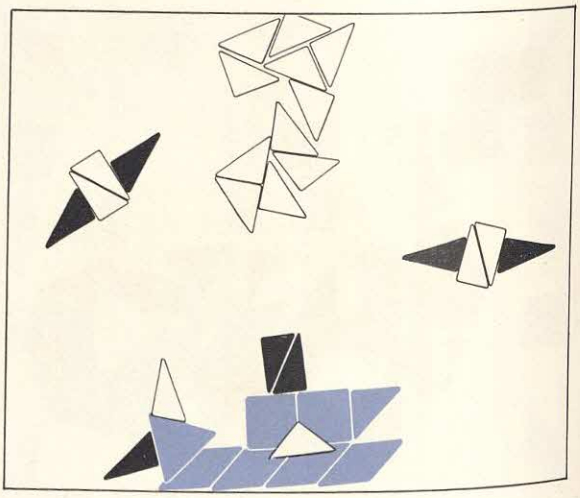
c) Girl S. B. Scene: house, brook, trees, grass, sky.



d) Boy T. H. Object: boat.



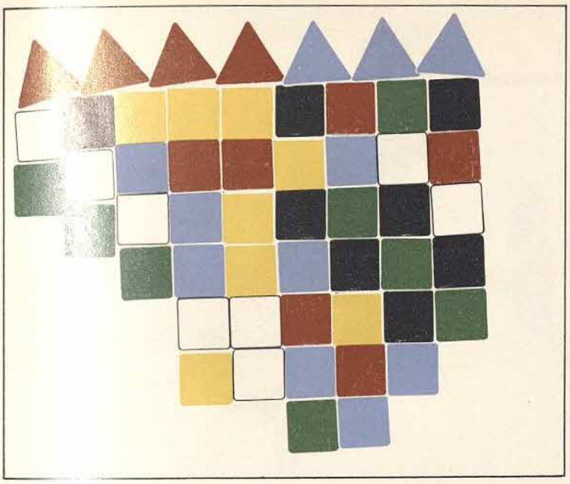
e) Boy T. I. Object: two rocket ships and a space man.



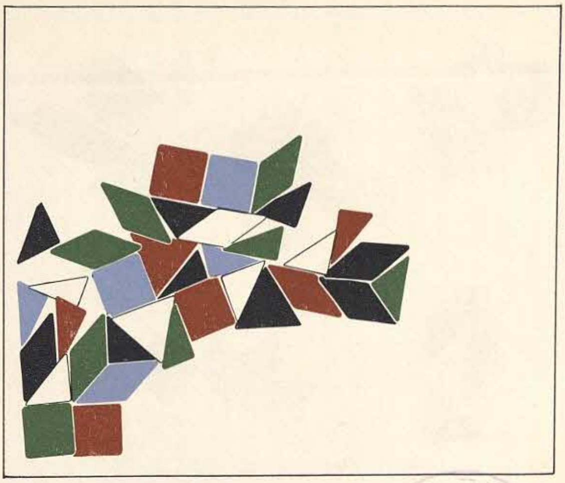
f) Boy B. R. Scene: boat, sea gulls, clouds.

PLATE 10

Nine years

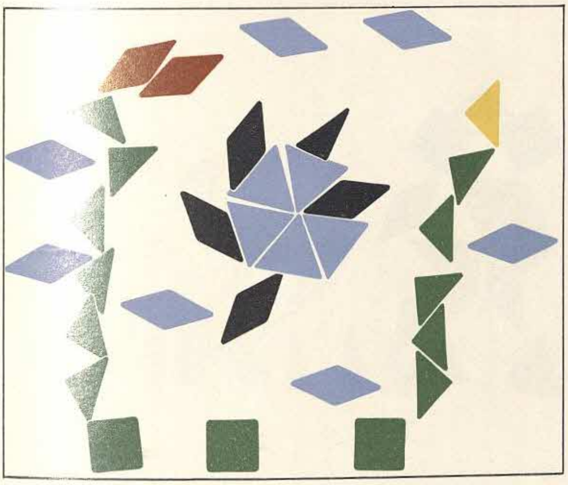


a) Girl N. C. Central design: squares and triangles.

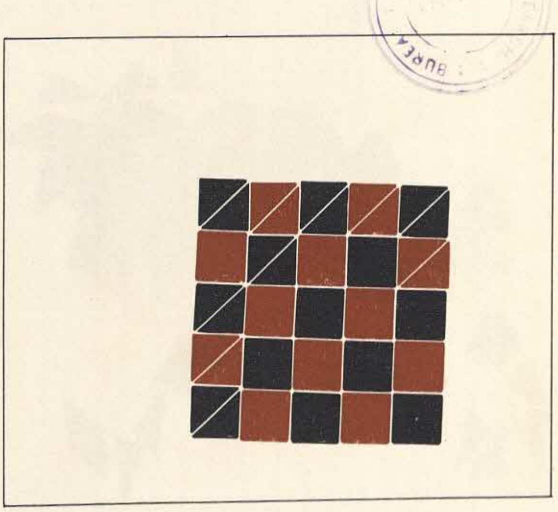


b) Girl B. N. Slab.

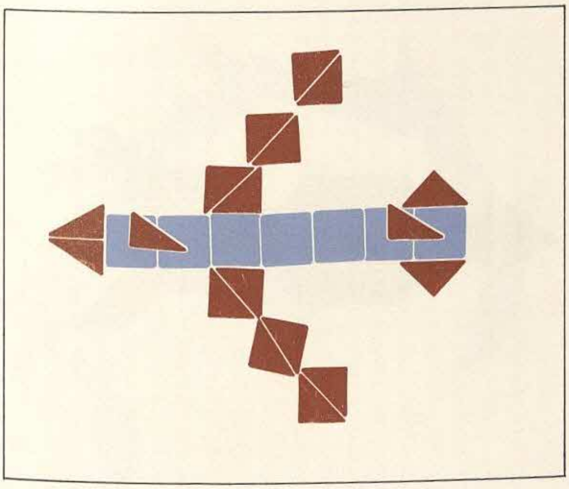
BUREA



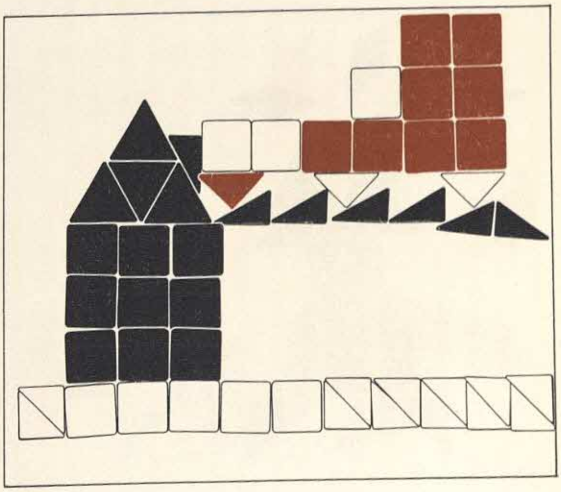
c) Girl C. C. Scene: turtle with reeds and water.



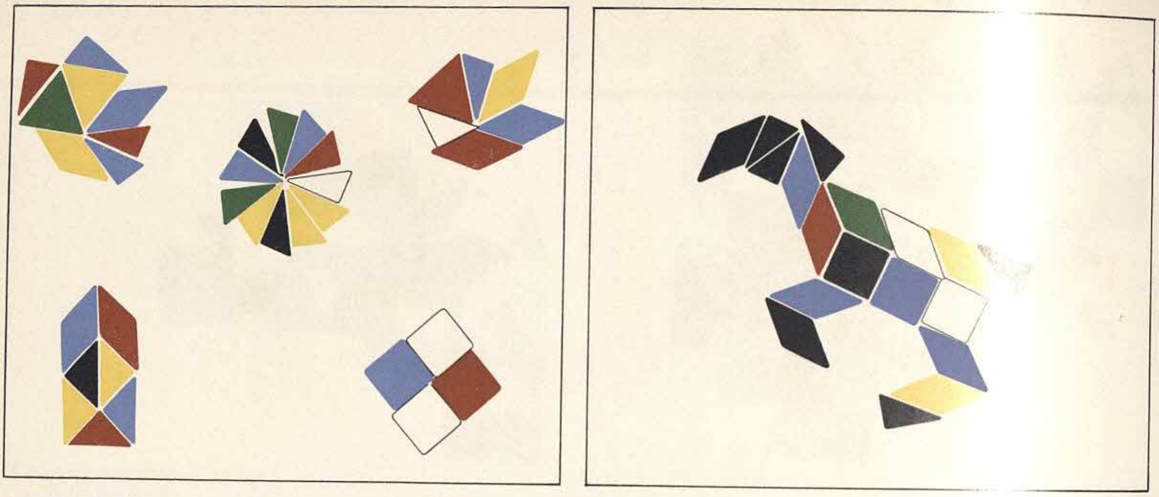
d) Boy B. R. Central design: checkerboard.



e) Boy R. B. Objects: jet plane.

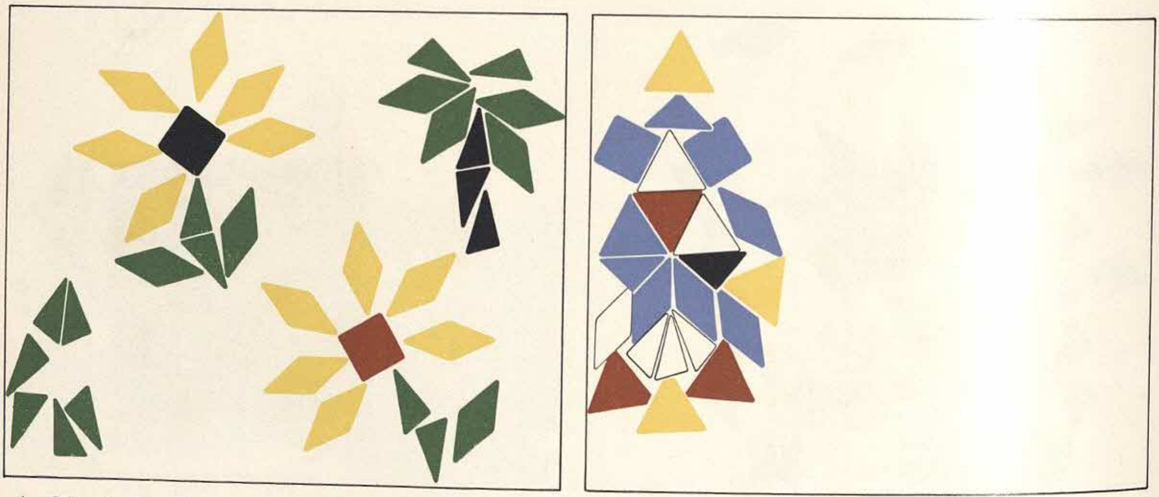


f) Boy L. B. Scene: Santa Claus on sled coming to house.



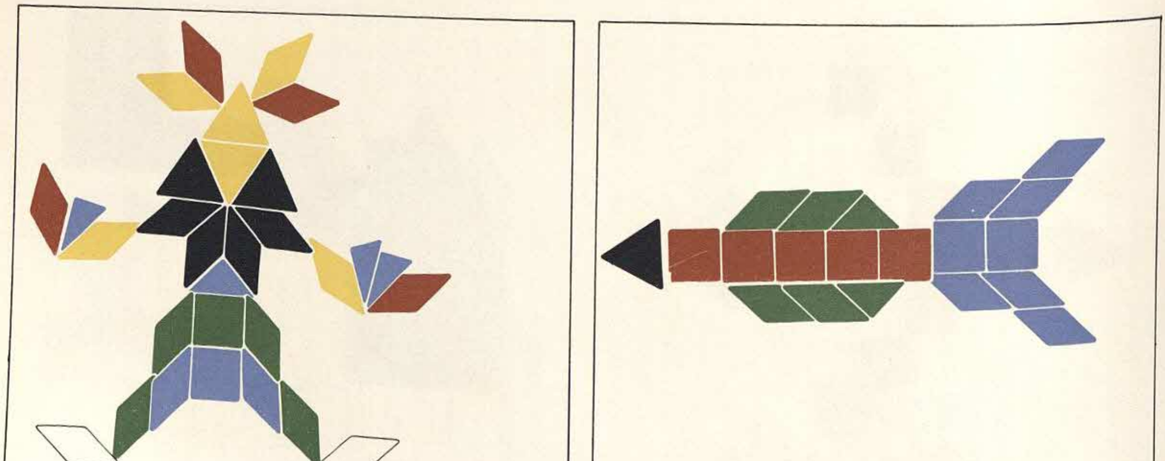
a) Girl P. C. Separate designs: design.

b) Girl L. B. Object: horse.



c) Girl J. G. Objects: flowers, pine tree, palm tree.

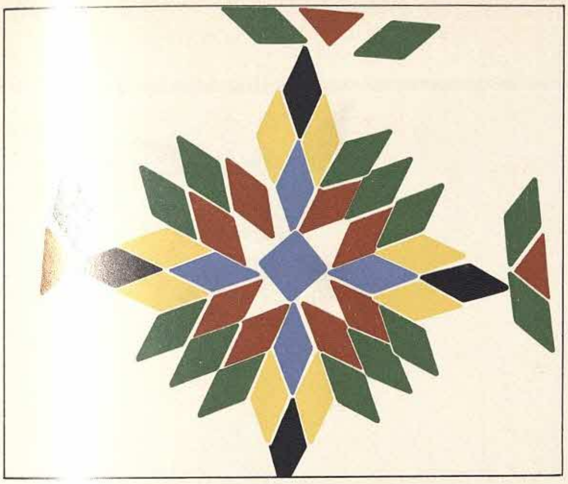
d) Boy M. H. Central design: design.



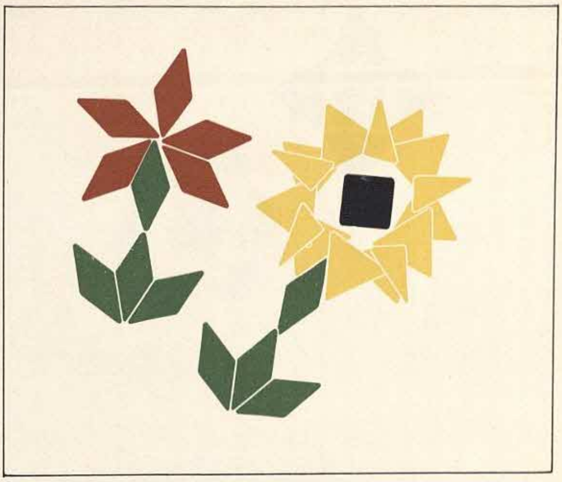
e) Boy G. L. Object: person.

f) Boy D. L. Object: jet ship.

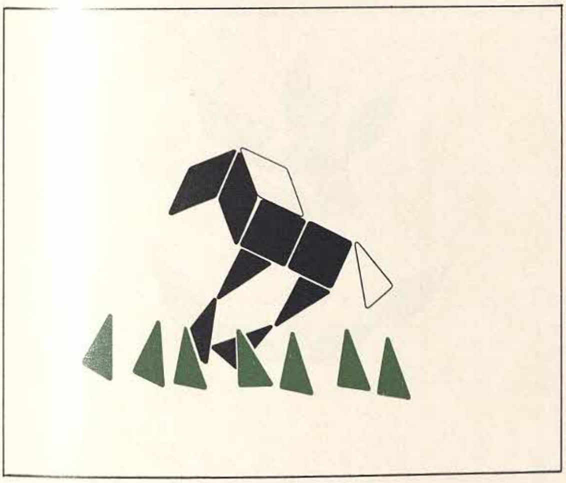
PLATE 12 *Eleven years*



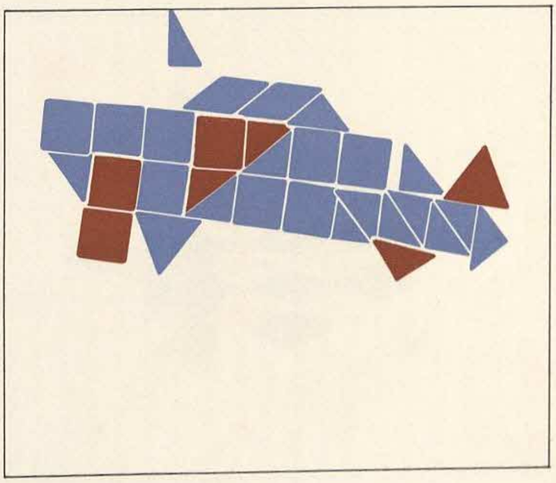
a) Girl P. R. Central design: kaleidoscope design.



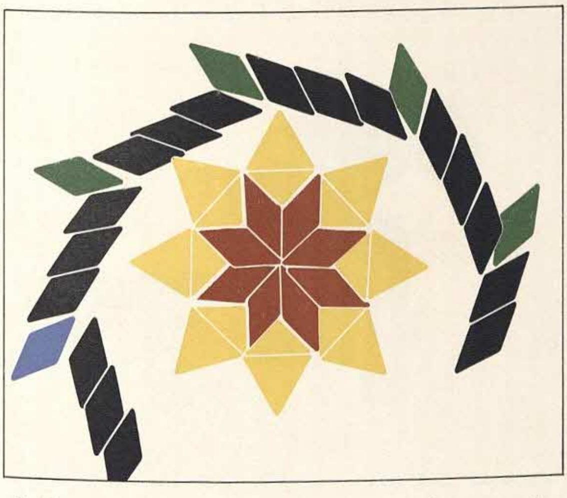
b) Girl G. H. Object: flowers.



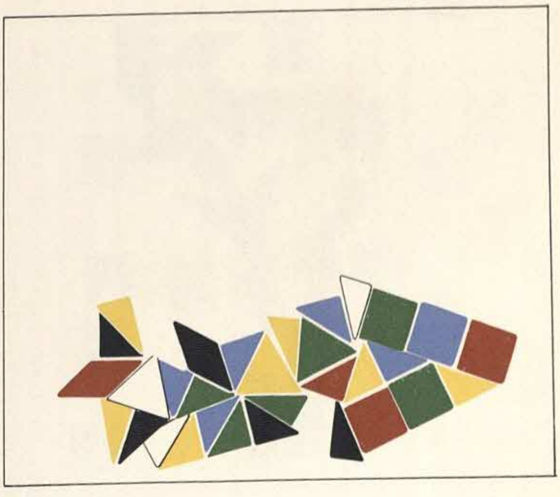
c) Girl L. B. Scene: horse and grass.



d) Boy M. R. Object: jet plane.

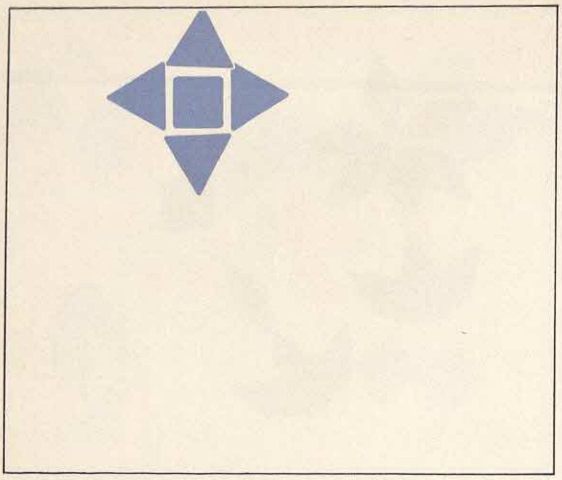


e) Boy R. H. Central design: explosion seen in dream.

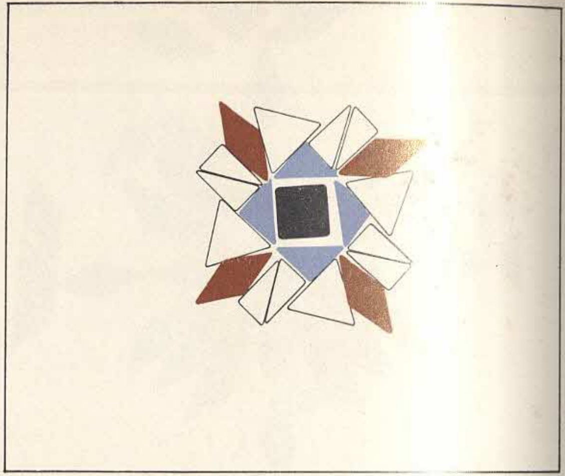


f) Boy C. G. Slab.

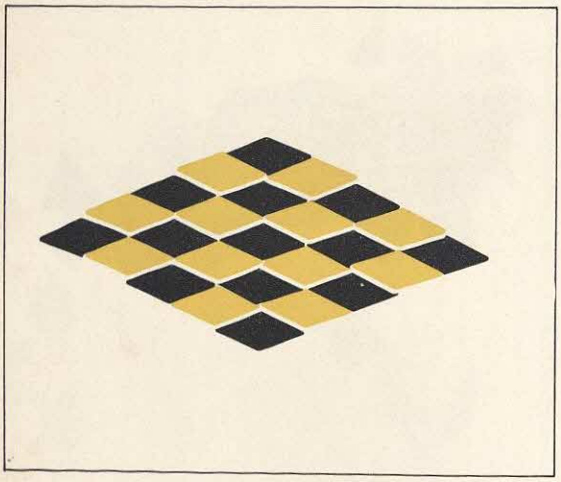
Twelve years



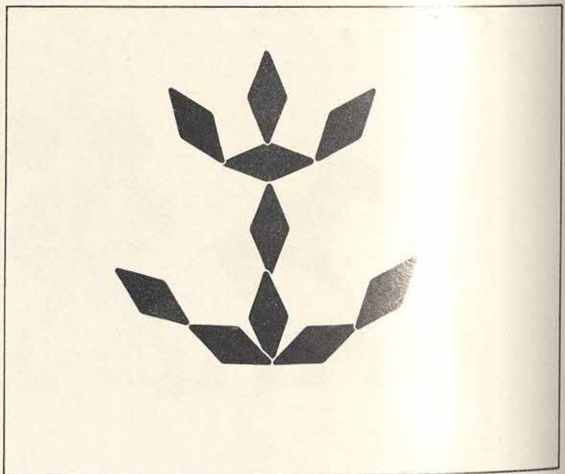
a) Girl G. F. Central design: design.



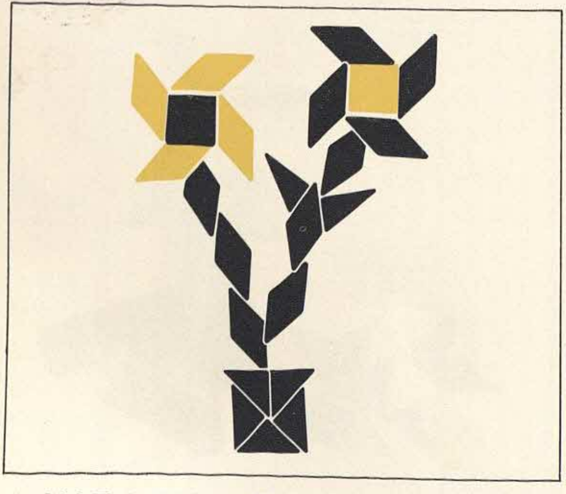
b) Girl R. B. Central design: design.



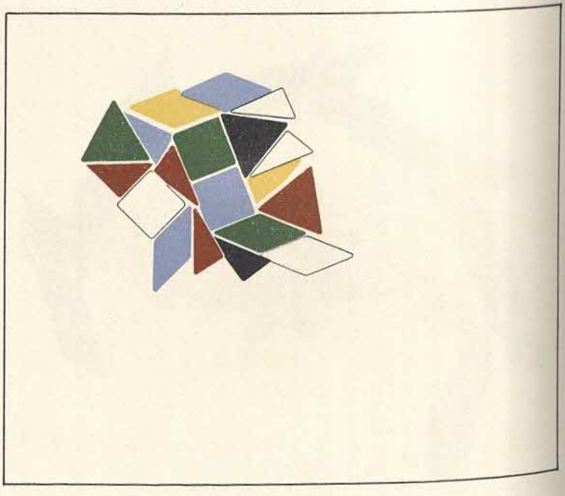
c) Girl M. J. D. Central design: design.



d) Girl N. C. Object: flower.

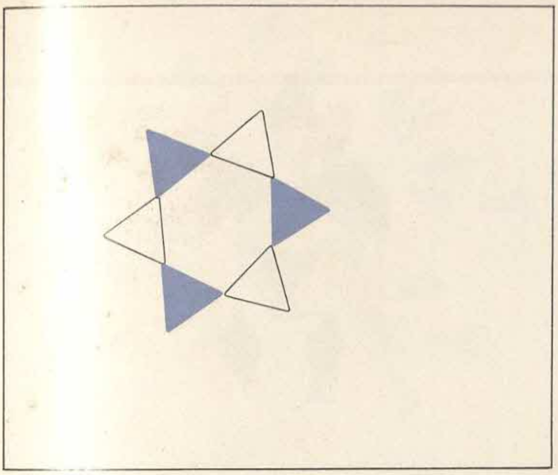


e) Girl T. I. Object: flower.

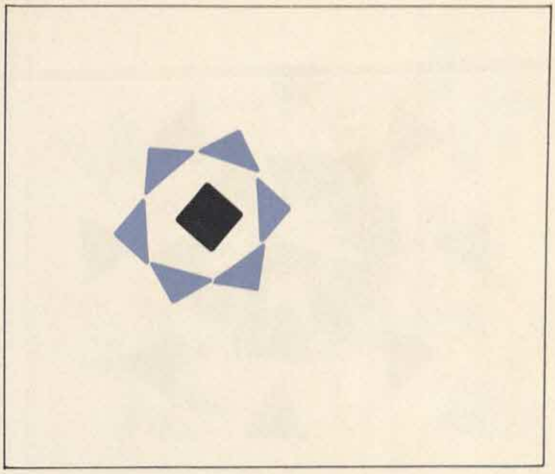


f) Girl K. S. Slab: design.

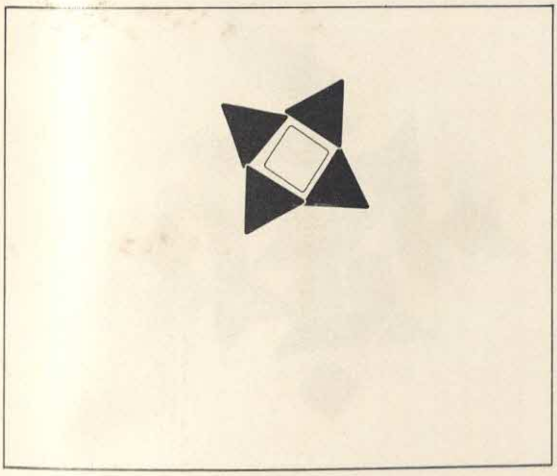
PLATE 14 *Thirteen years—girls*



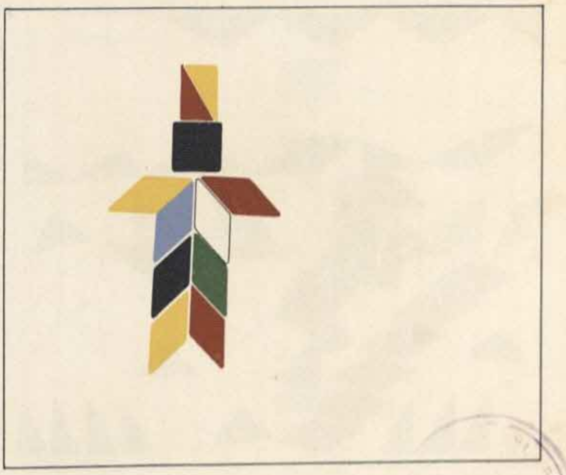
a) Boy J. H. Central design: design.



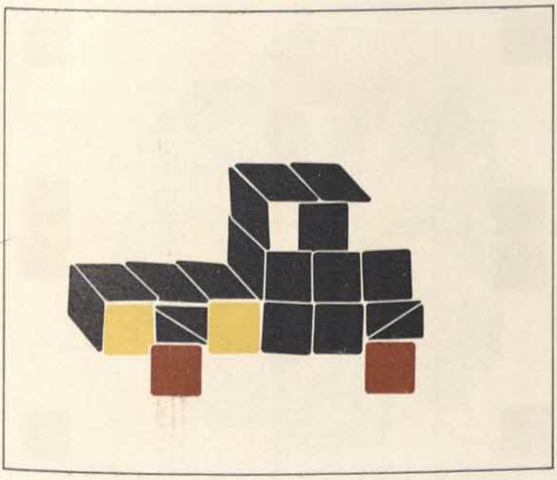
b) Boy R. M. Central design: design.



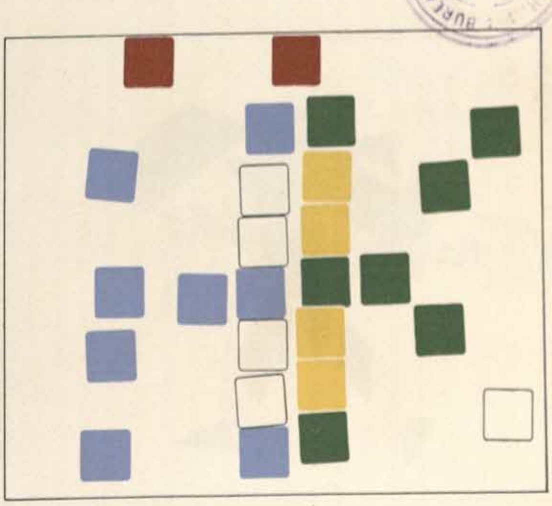
c) Boy W. C. Central design: design.



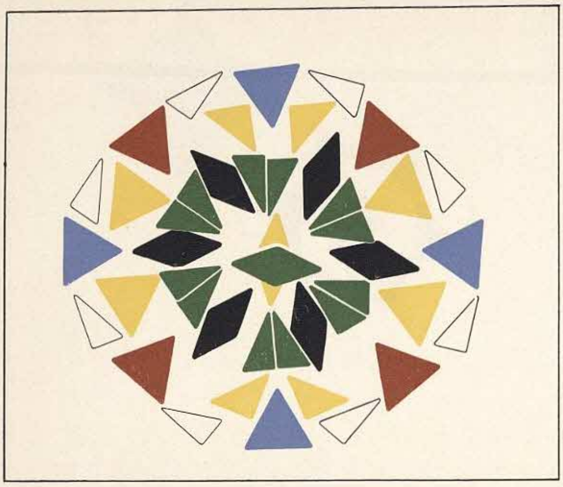
d) Boy T. S. Object: man.



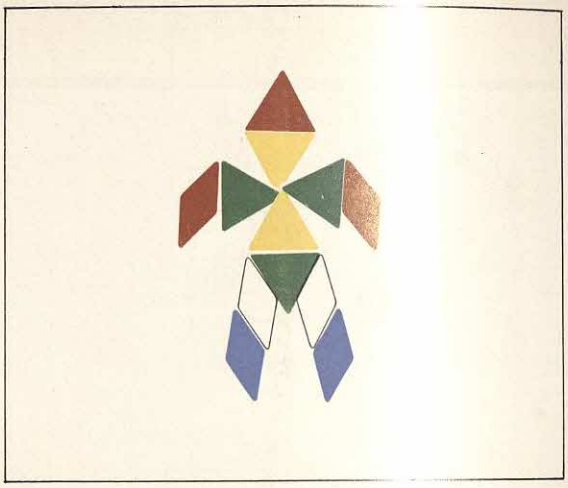
e) Boy R. C. Object: Model-T truck.



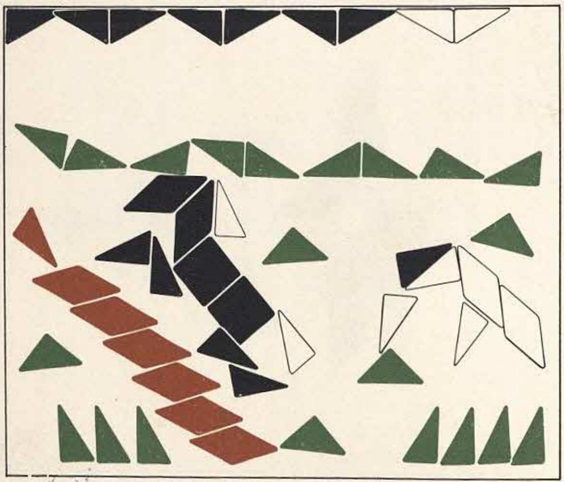
f) Boy B. B. Scene: football game.



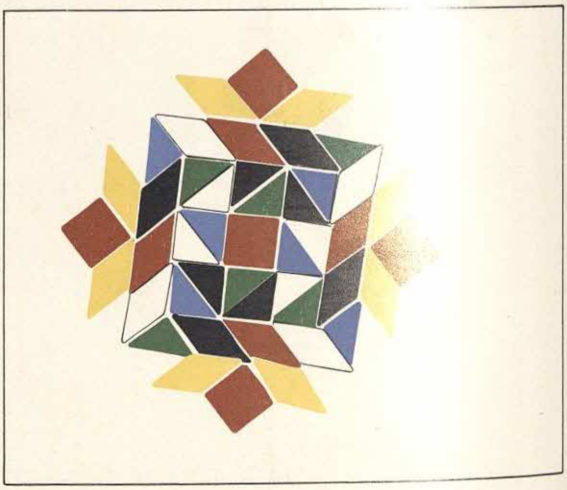
a) Girl E. B. Central design: design.



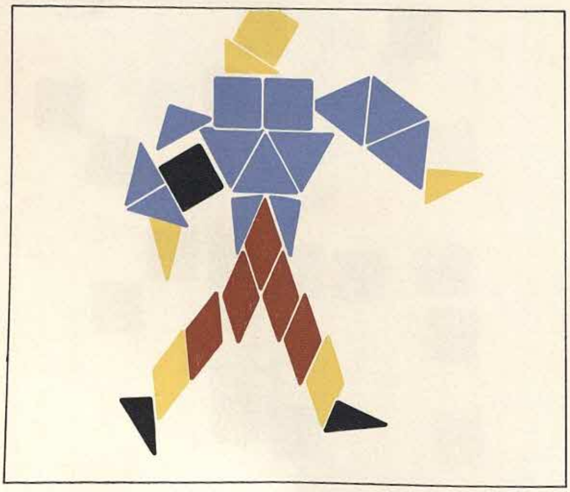
b) Girl B. L. Object: person.



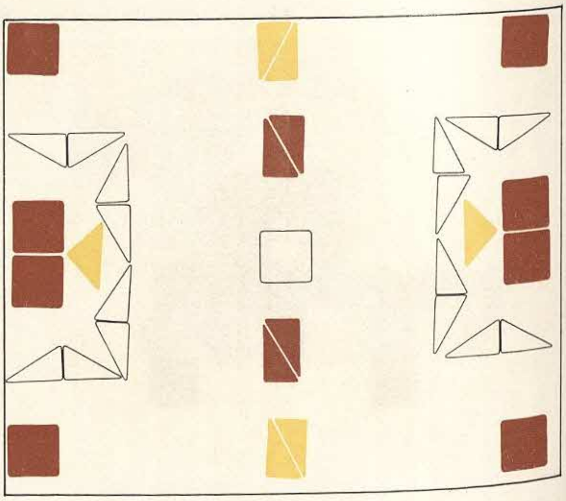
c) Girl L. B. Scene: mare grazing and black one jumping a fence.



d) Boy D. J. Central design: design.

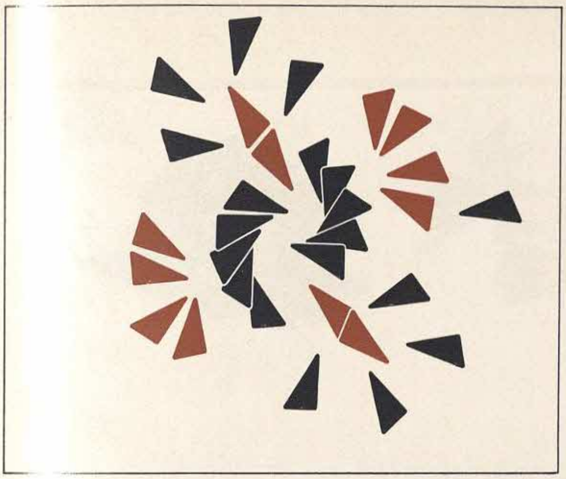


e) Boy H. C. Object: football player.

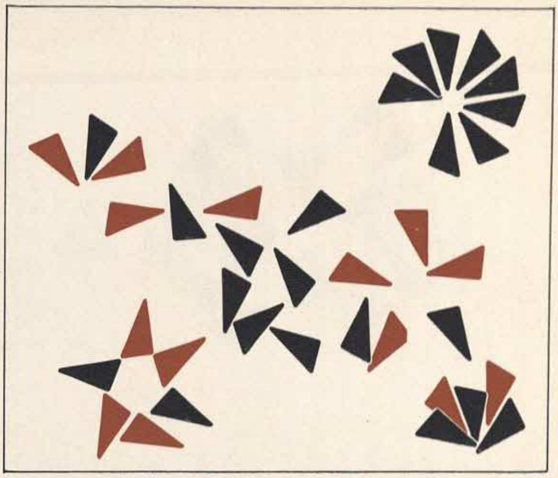


f) Boy B. B. Scene: soccer field.

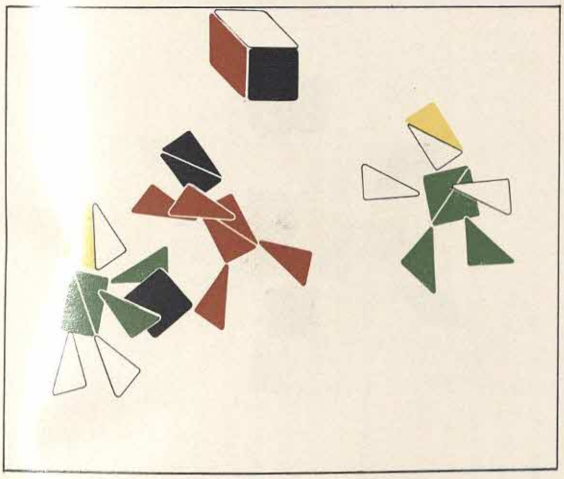
PLATE 16 *Fourteen years*



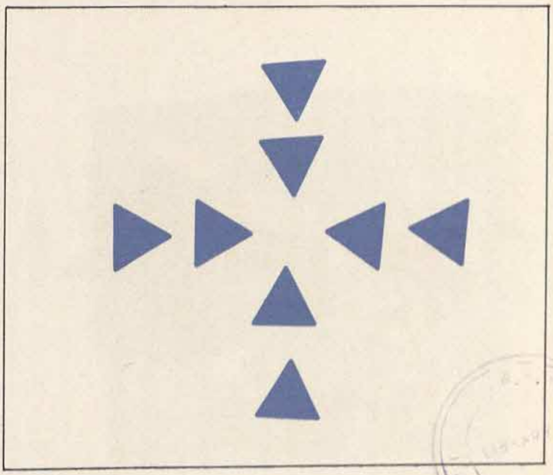
a) Girl E. B. Central design: design.



b) Girl M. B. Central design: design.

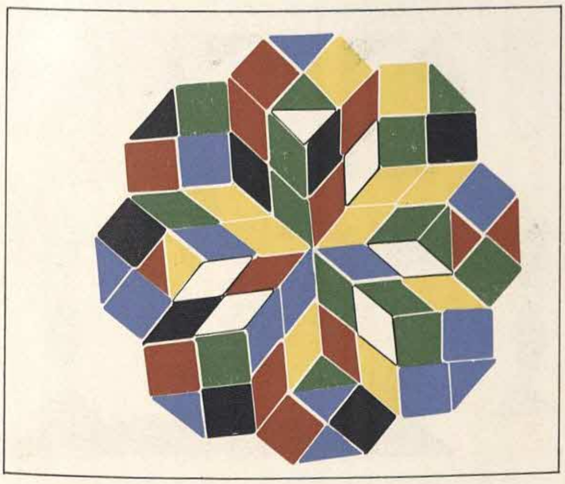


c) Girl K. P. Scene: basketball game.

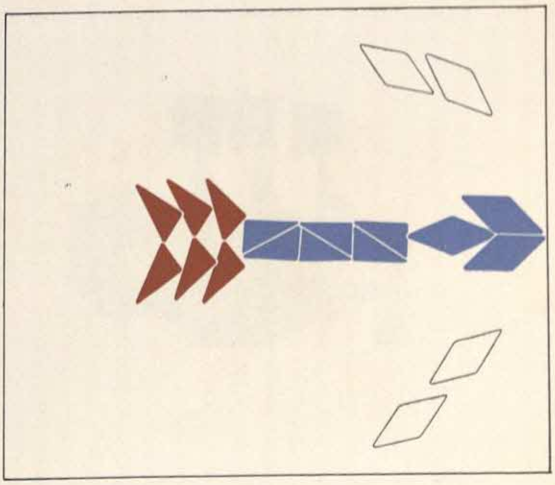


d) Boy J. G. Central design: school colors—pointing to empty center.

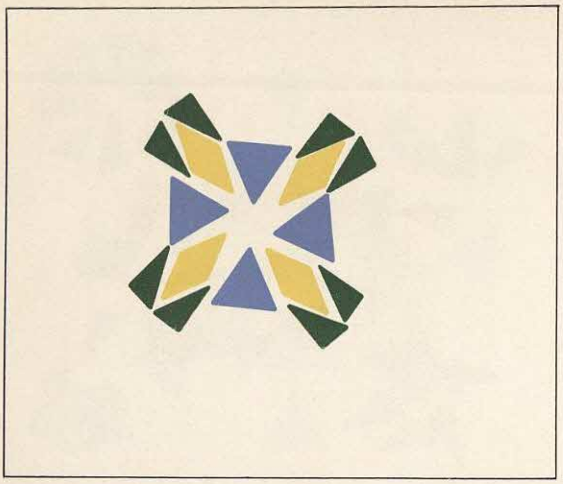
RESEARCH



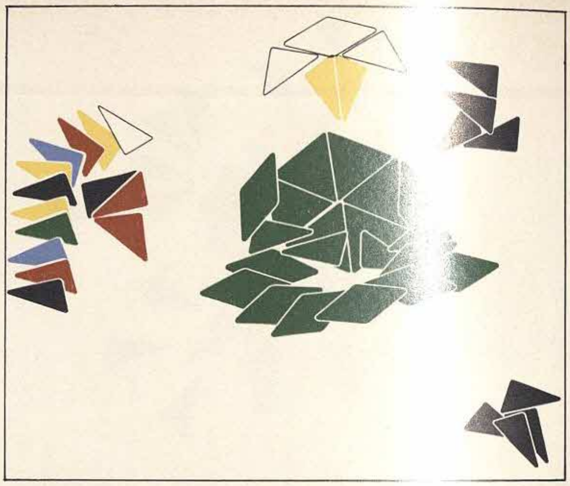
e) Boy H. V. C. Central design: design.



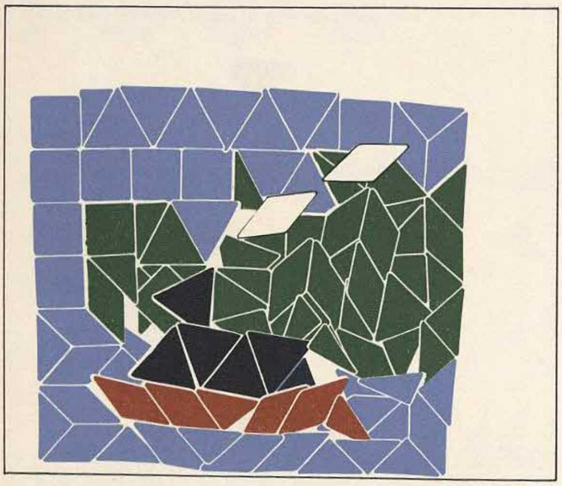
f) Boy J. H. Object: arrow.



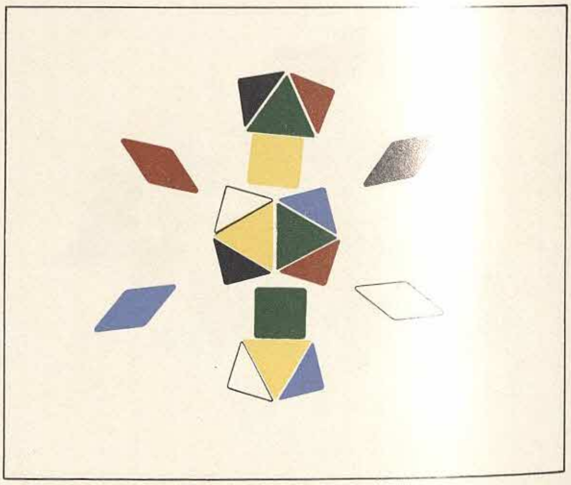
a) Girl J. G. Central design: design.



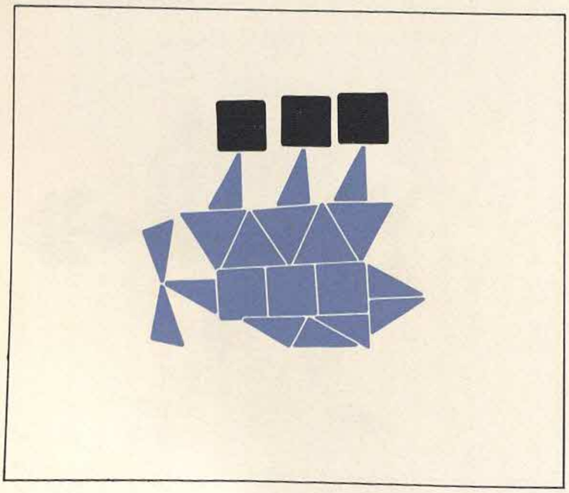
b) Girl B. A. Scene: Indian sitting cross-legged, pin wheel, birds.



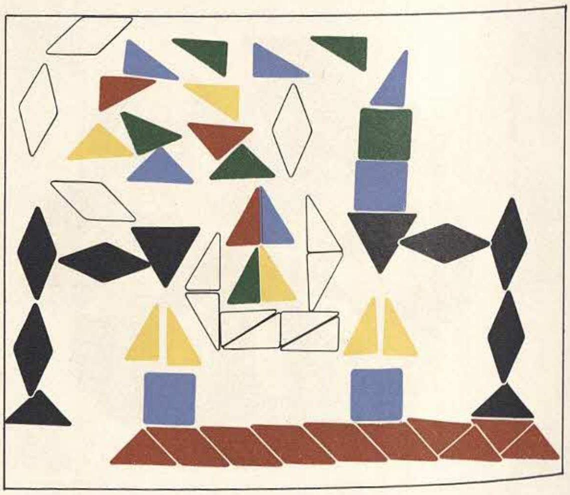
c) Girl J. A. Scene: boat sailing by island.



d) Boy M. G. Central design: design.



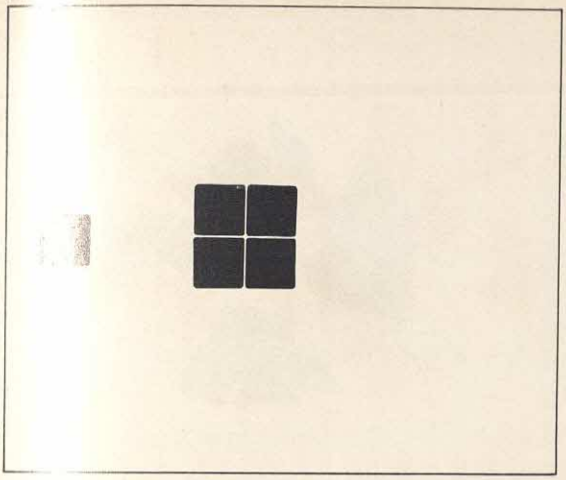
e) Boy J. G. Object: V-8.



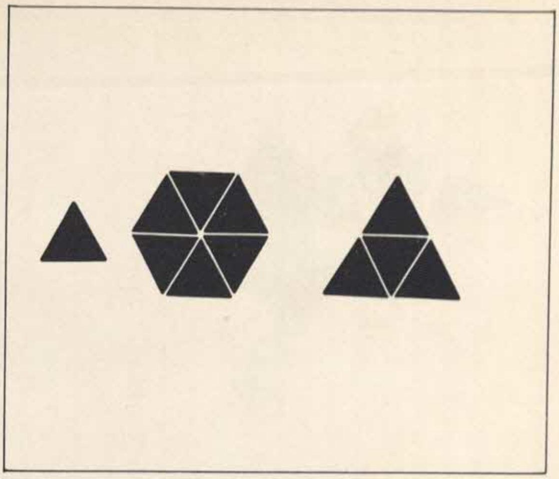
f) Boy J. B. Scene: chemistry experiment.

PLATE 18

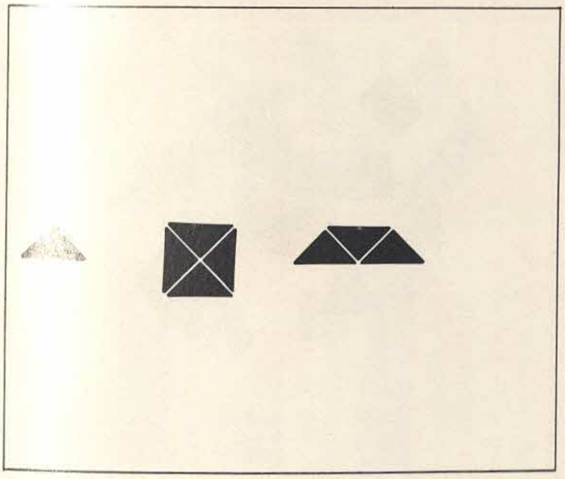
Sixteen years



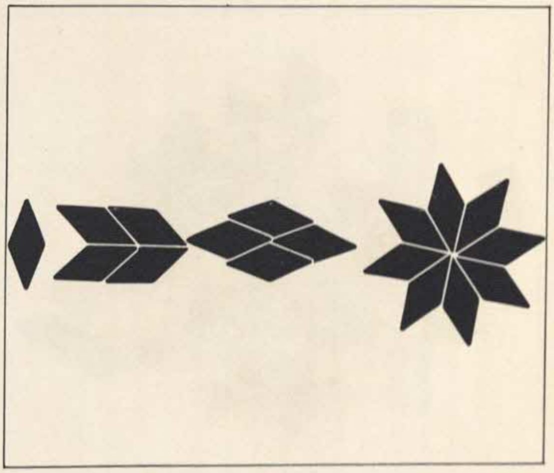
a) Square, 4 years.



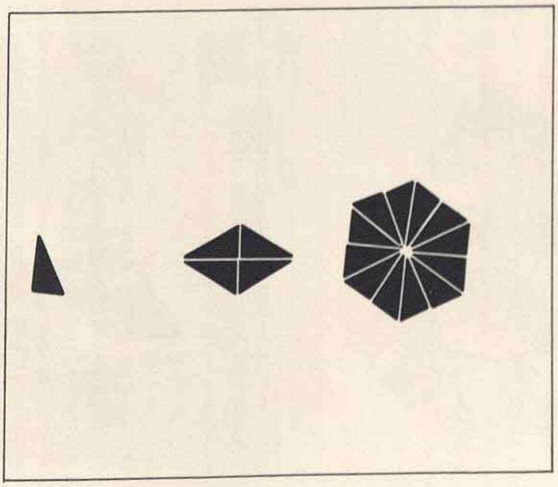
b) Large triangle, 4 years.



c) Equilateral triangle, 4 years.



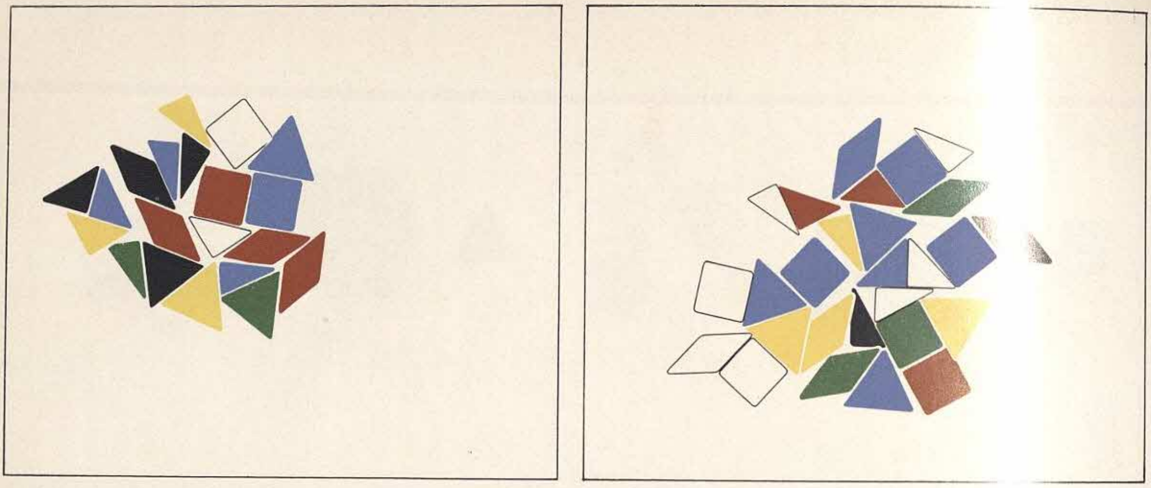
d) Diamond. Arrow first appears at 6 years; diamond and star at 7 years.



e) Scalene triangle, 8 years.

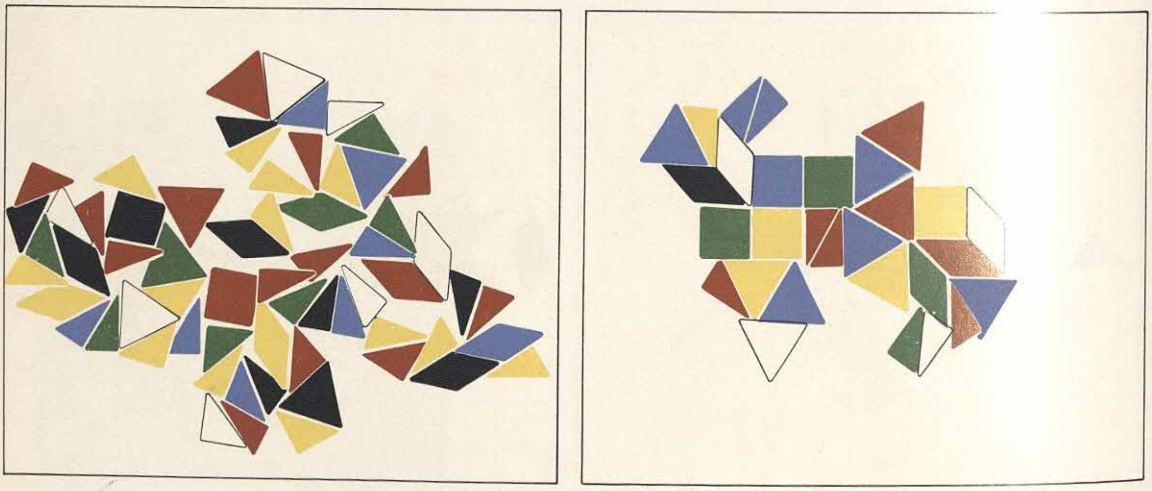
Basic fundamental forms made from various shapes

PLATE 19



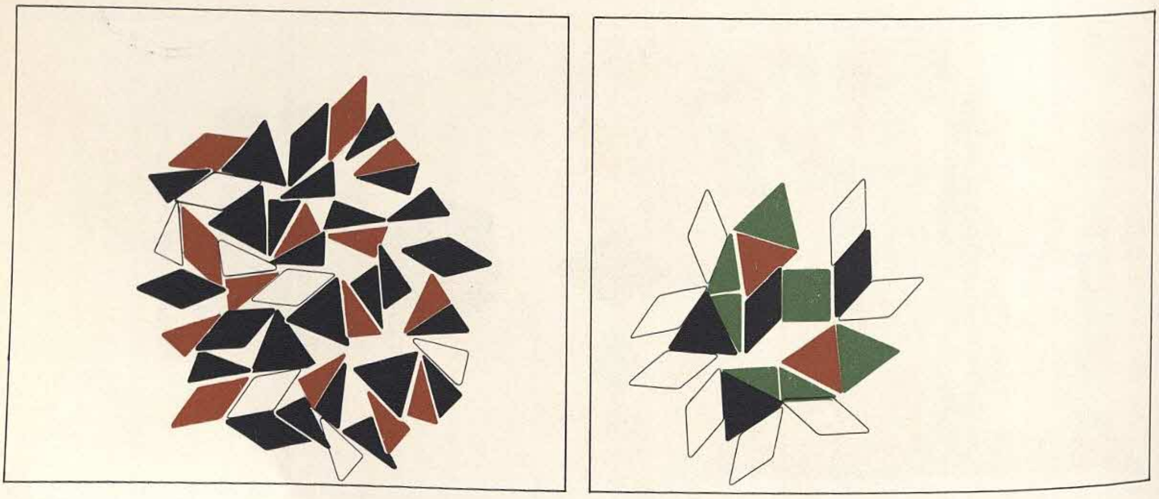
a) Girl J. O. 6 years.

b) Girl J. M. 8 years.



c) Girl E. D. 11 years.

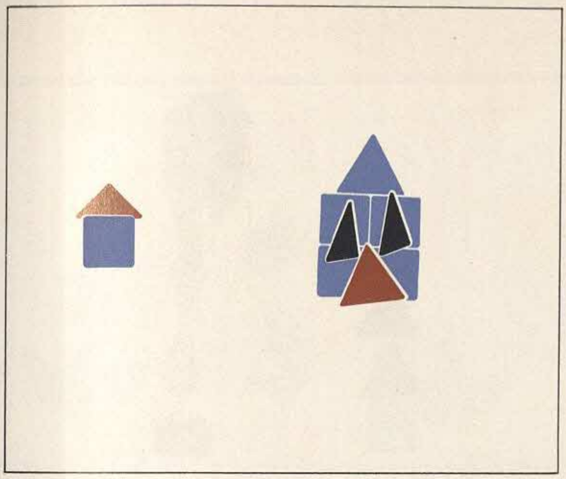
d) Girl B. L. 12 years.



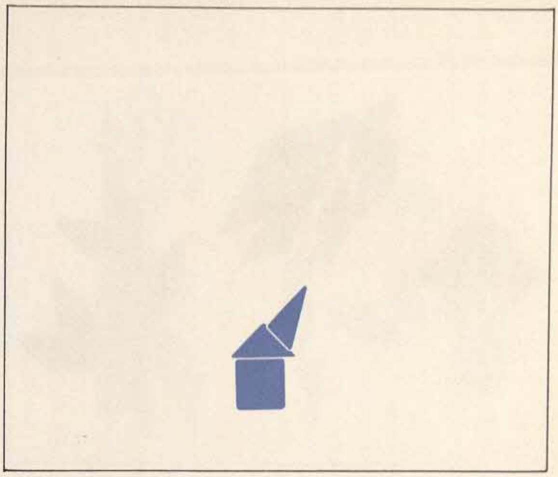
e) Girl M. B. 15 years.

f) Girl R. B. 16 years.

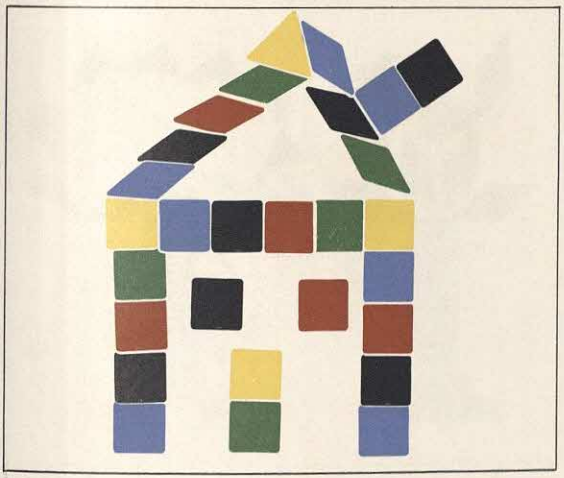
PLATE 20 *Slabs—typical at increasing ages*



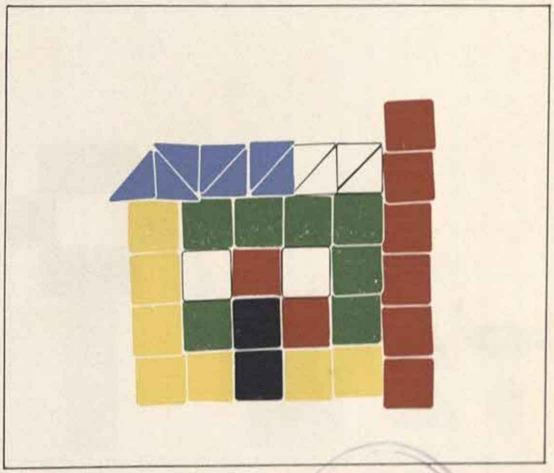
a) Girls L. C., A. S. 5 years: 2-piece house, small compact house.



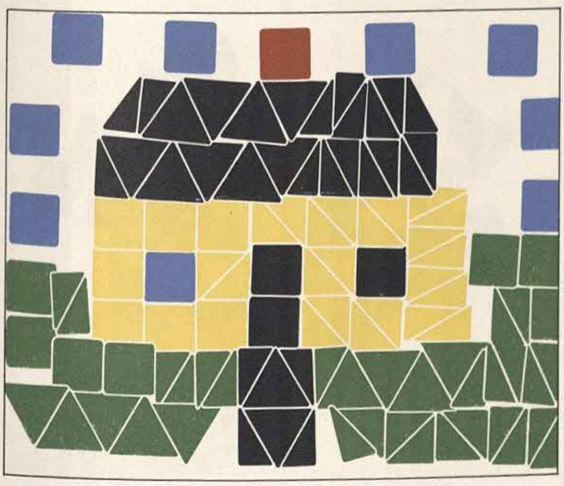
b) Girl V. M. 6 years: 2-piece house with chimney.



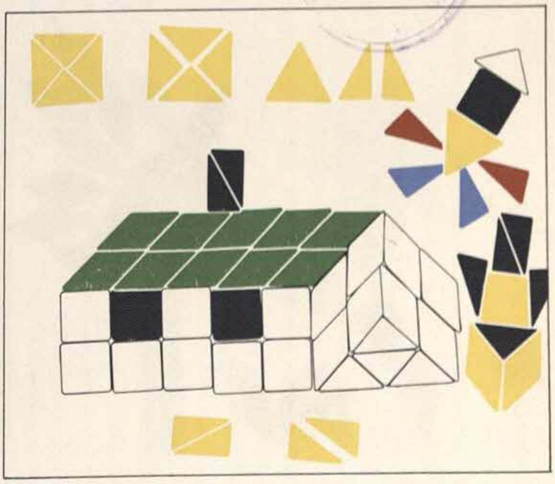
c) Boy M. M. 7 years: open square house.



d) Girl F. G. 10 years: solid square structure.

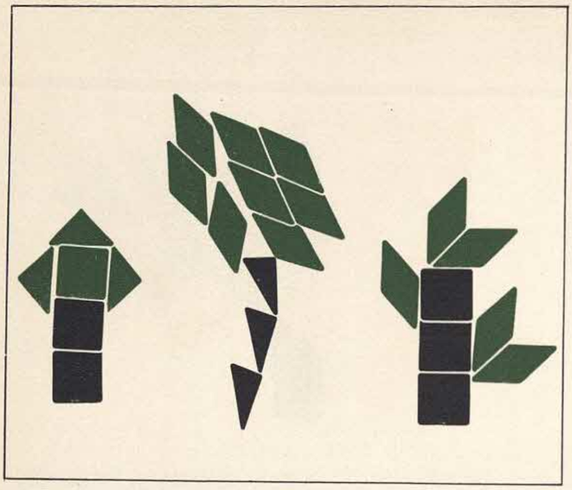


e) Girl F. G. 13 years: complex fitted house.

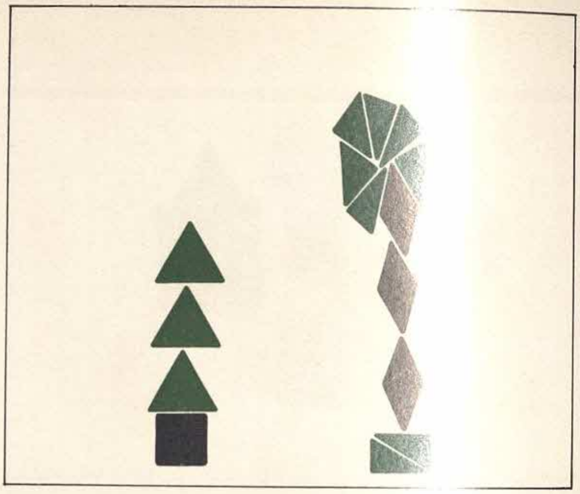


f) Boy G. W. 16 years: structure as drawn by adult.

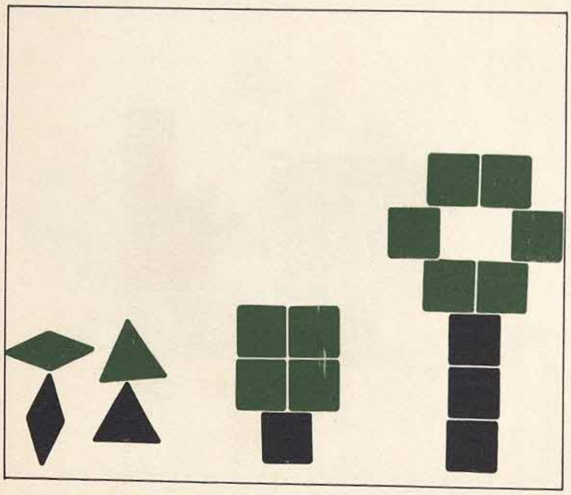
Houses—typical at increasing ages



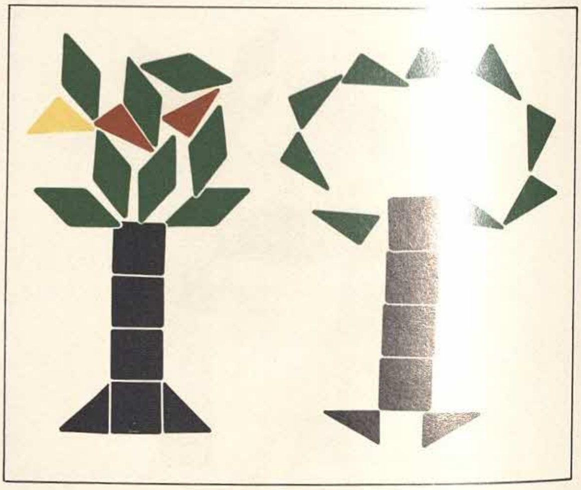
a) Girls A. B., K. A. Boy A. W. 5, 6, 6 years.



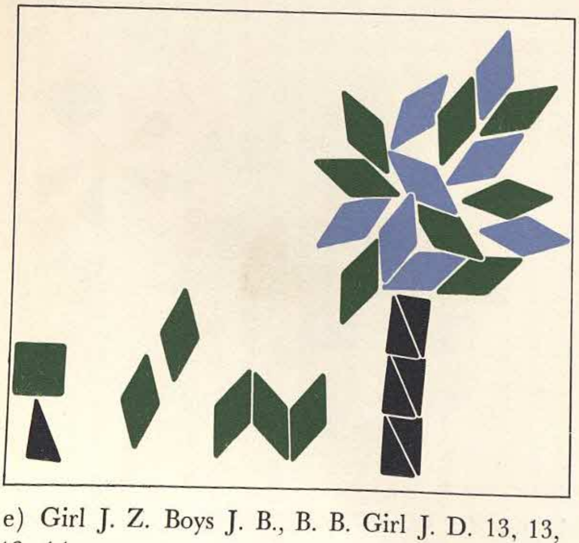
b) Girls H. E., U. G. 7, 7 years.



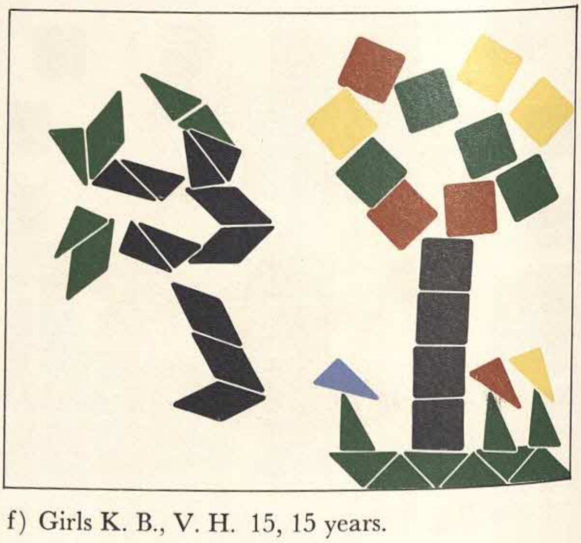
c) Girls P. B., M. B., D. G. 8, 9, 9 years.



d) Girls M. B., C. D. 10, 10 years.

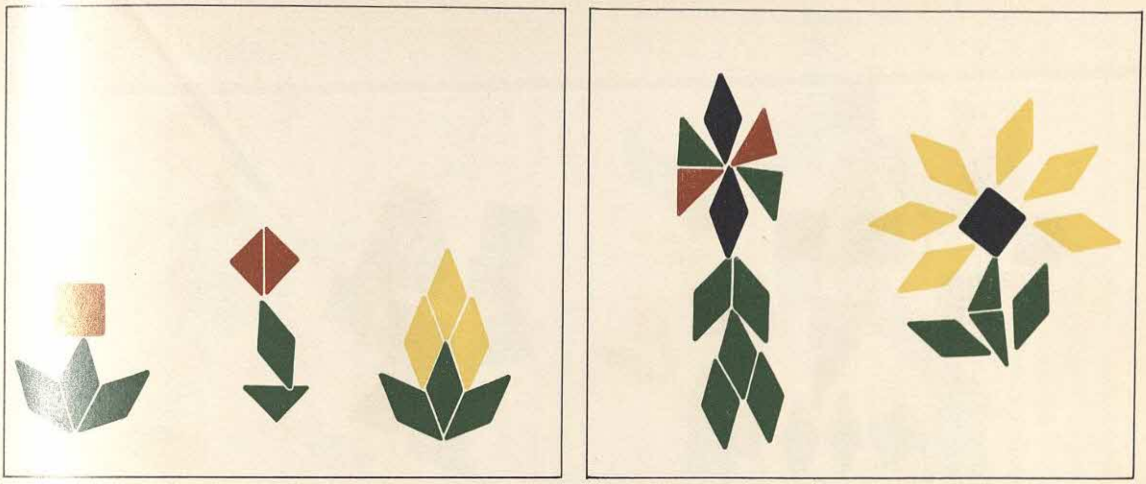


e) Girl J. Z. Boys J. B., B. B. Girl J. D. 13, 13, 13, 14 years.



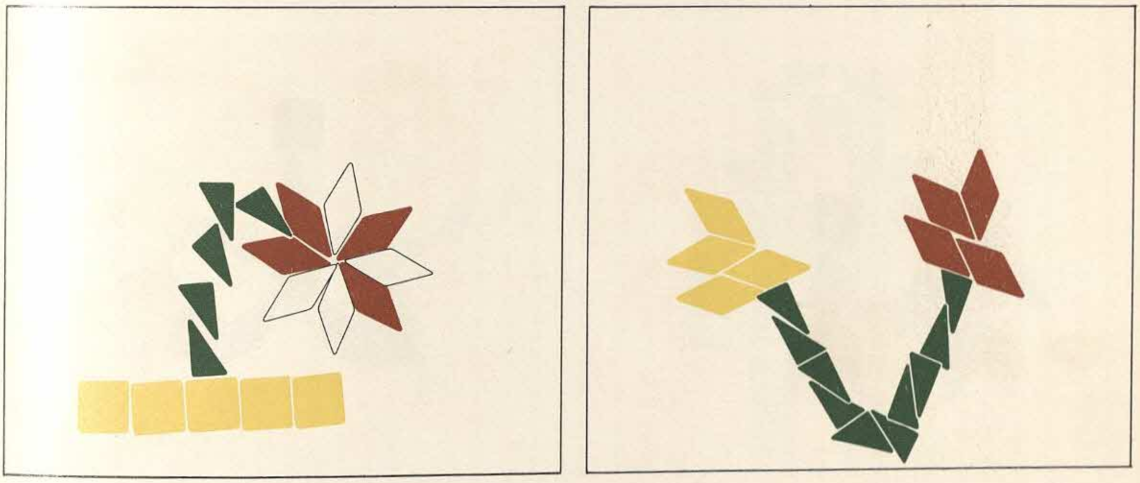
f) Girls K. B., V. H. 15, 15 years.

PLATE 22 *Trees—typical at increasing ages*



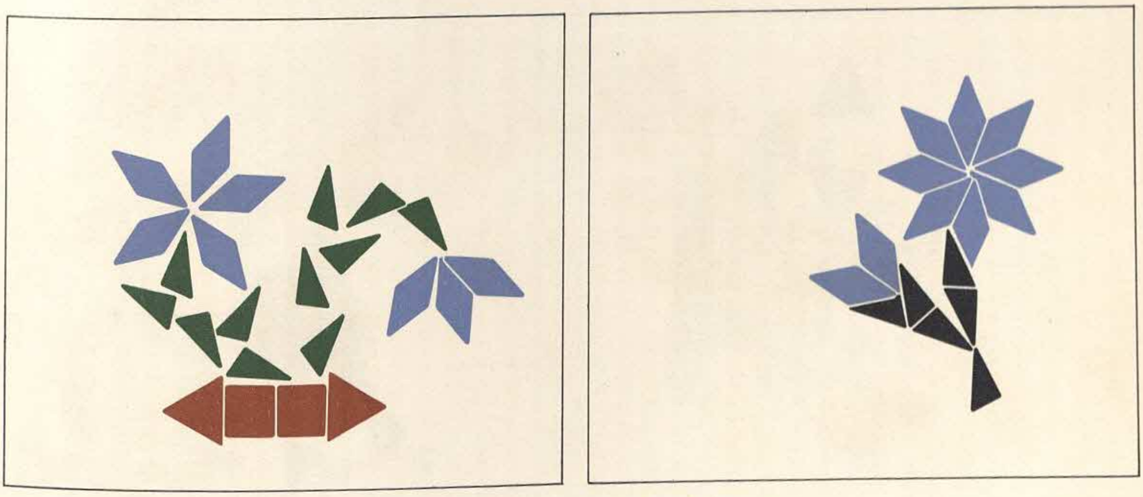
a) Girls A. A., K. A., T. L. 5, 7, 8 years.

b) Girls E. S., J. G. 11, 11 years.



c) Girl N. M. 12 years.

d) Girl T. L. 13 years.

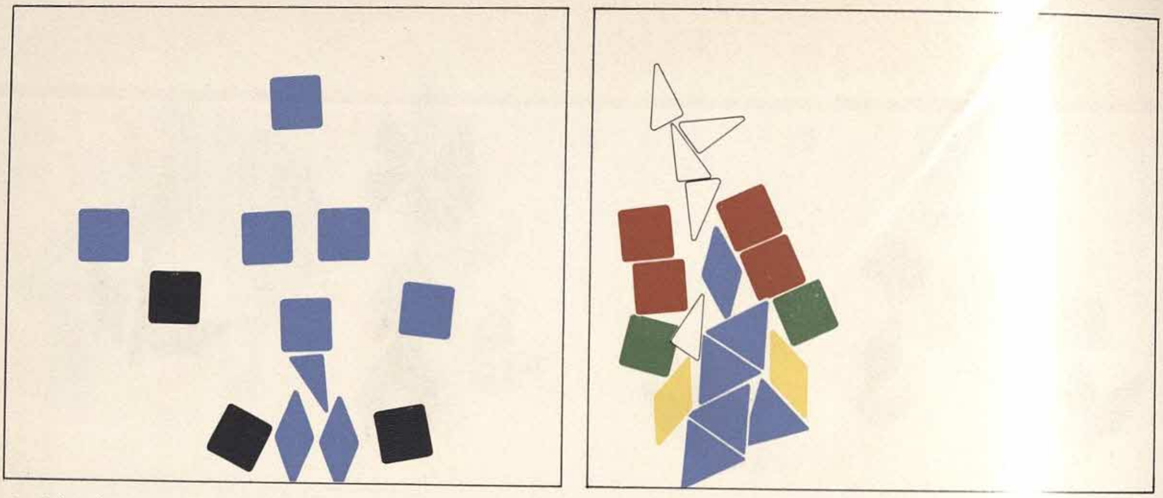


e) Girl M. L. 14 years.

f) Girl T. L. 15 years.

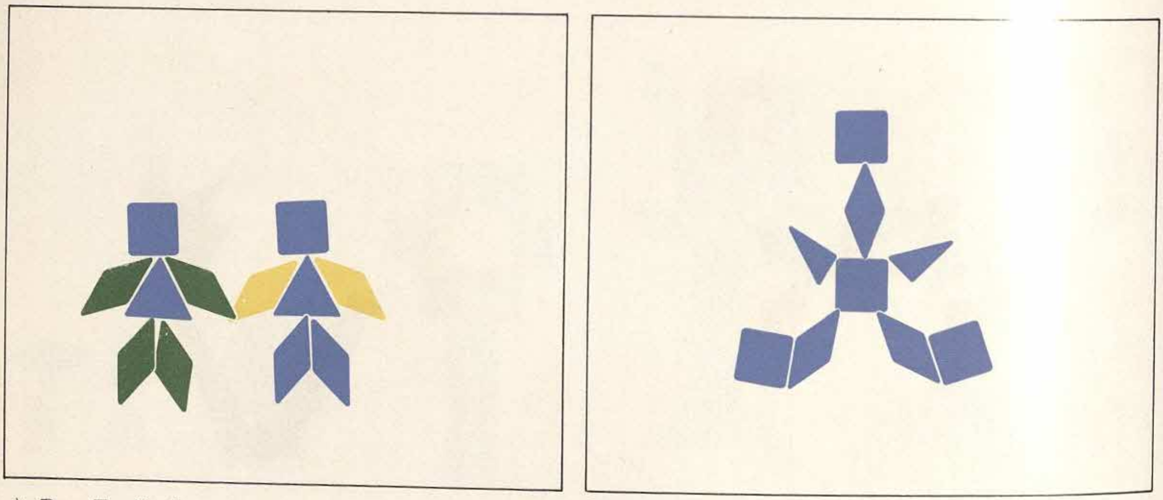
Flowers—typical at increasing ages

PLATE 23



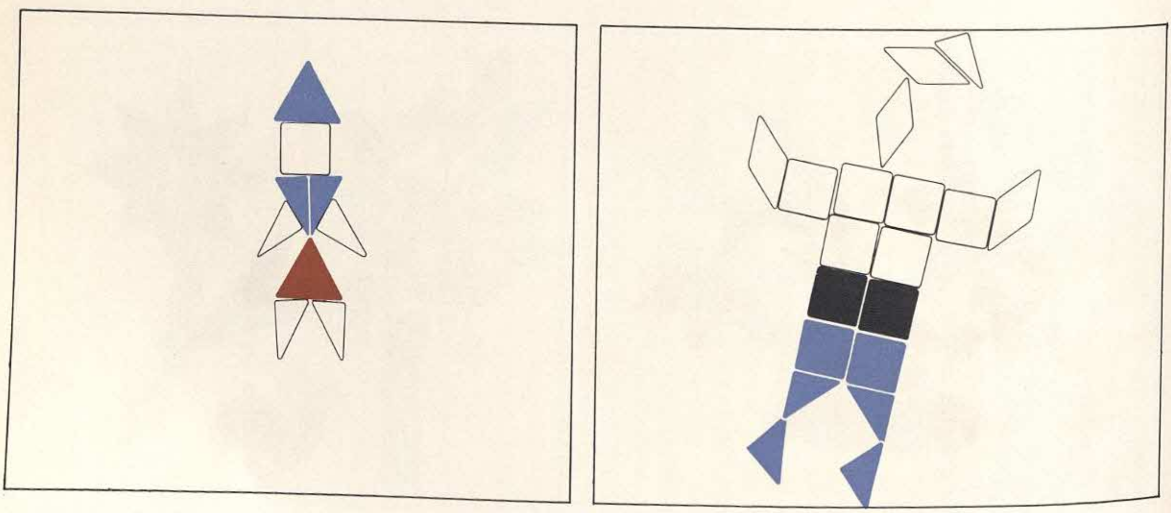
a) Girl A. B. 5 years: man.

b) Boy D. B. 5 years: man.



c) Boy T. G. 7 years: two boys holding hands.

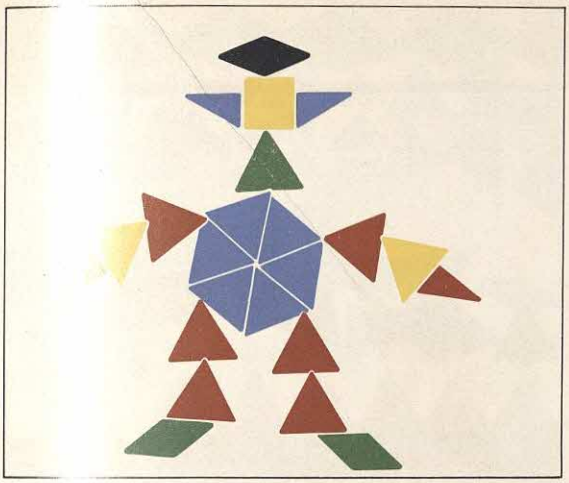
d) Boy C. B. 7 years: man.



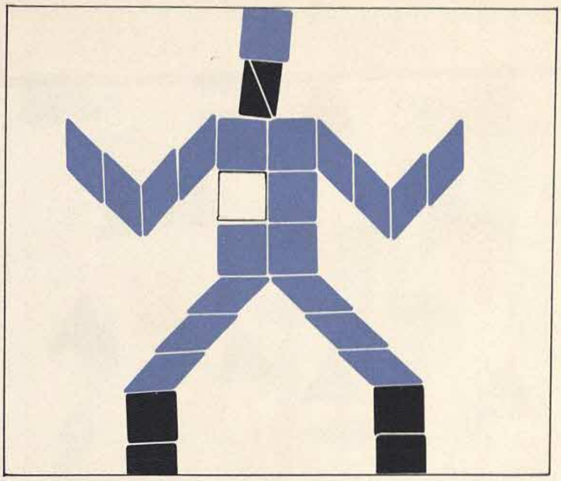
e) Girl M. G. 8 years: man or lady.

f) Girl P. R. 9 years: person.

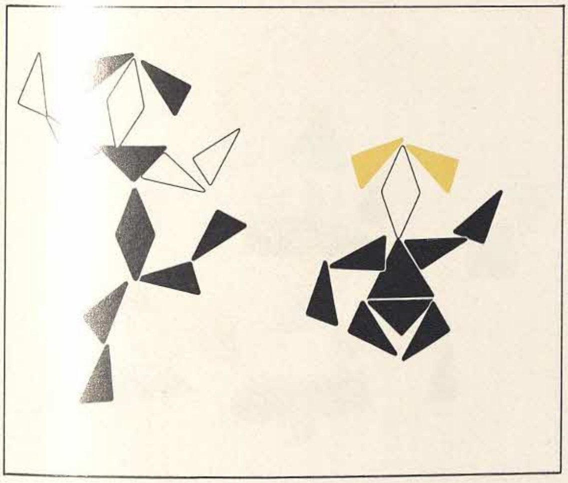
PLATE 24 *People—at increasing ages (5–9 years)*



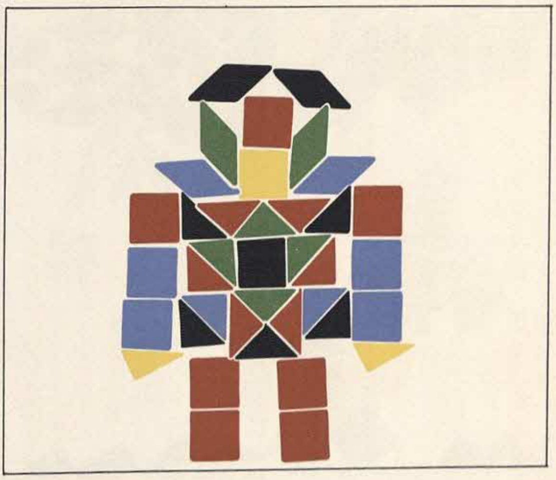
a) Boy G. L. 10 years: somebody from space.



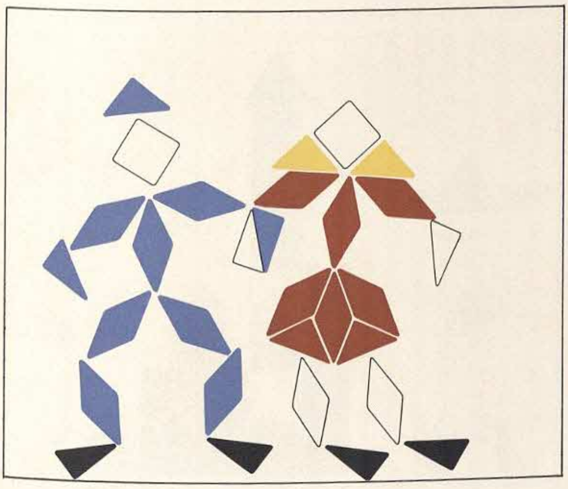
b) Boy T. F. 11 years: just a person.



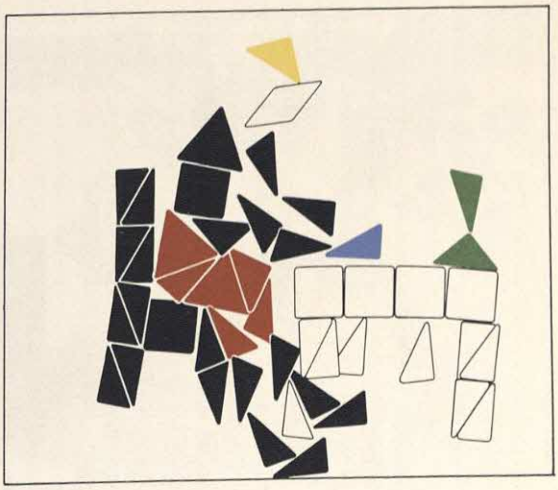
c) Girl U. G. 13 years: modern dance.



d) Boy B. H. 14 years: Martian.

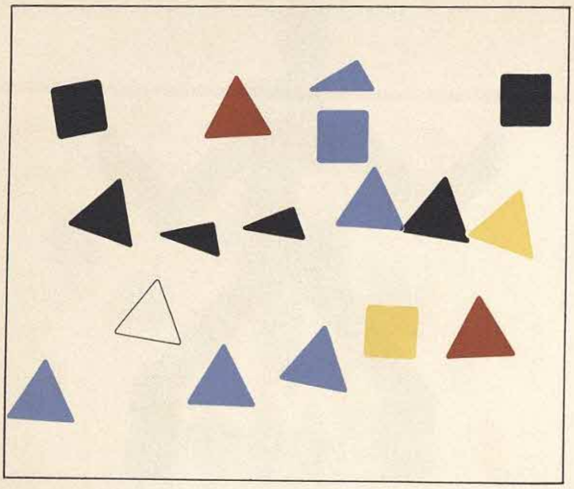


e) Girl L. F. 15 years: sailor and his girl, dancing.

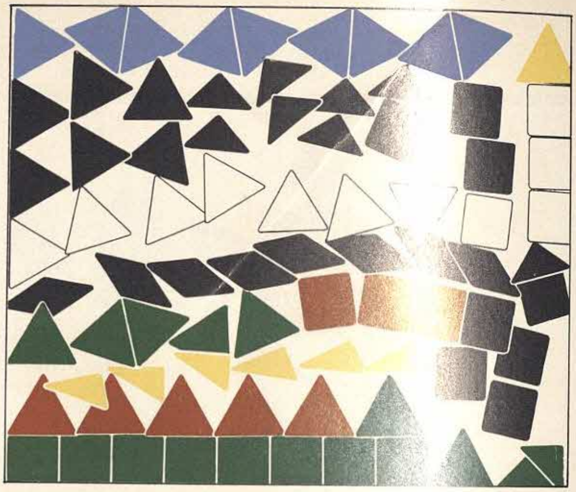


f) Girl U. G. 15 years: me, studying.

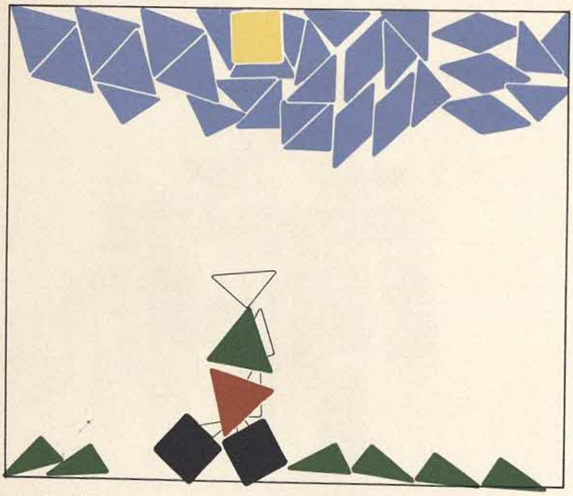
People—at increasing ages (10–15 years) **PLATE 25**



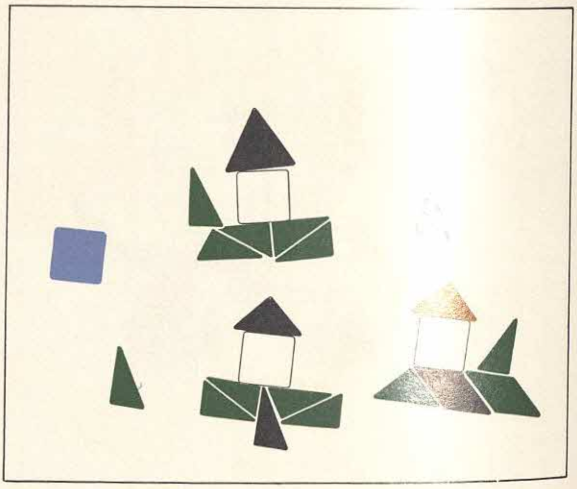
a) Boy S. T. 3½ years: stars, sun, mountain, sea, Cambridge, bumper for the sun, house.



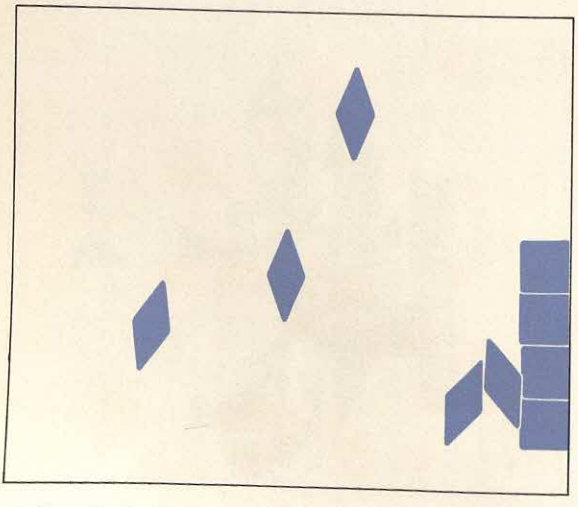
b) Girl P. S. 6 years: trees, flowers, grass, hills, bird, sky.



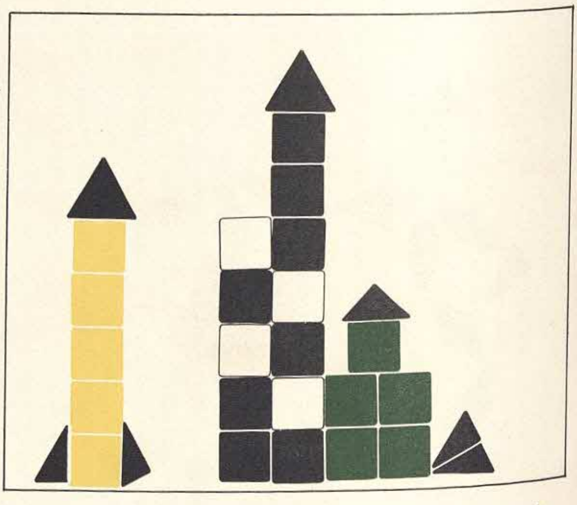
c) Girl K. A. 7 years: girl, sky, grass, sun.



d) Girl S. R. 8 years: village of houses, trees, pond.

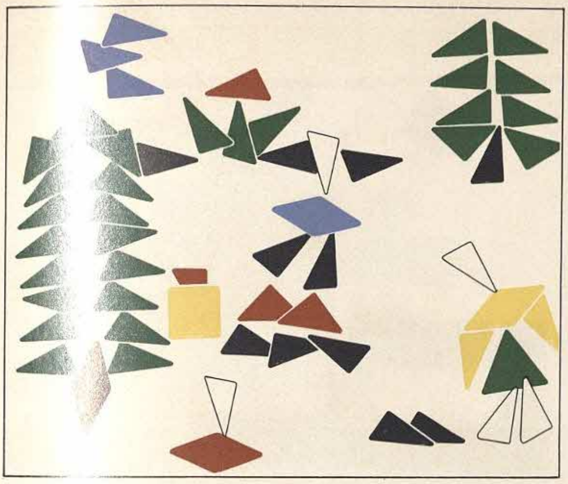


e) Boy A. S. 9 years: Bermuda Race.

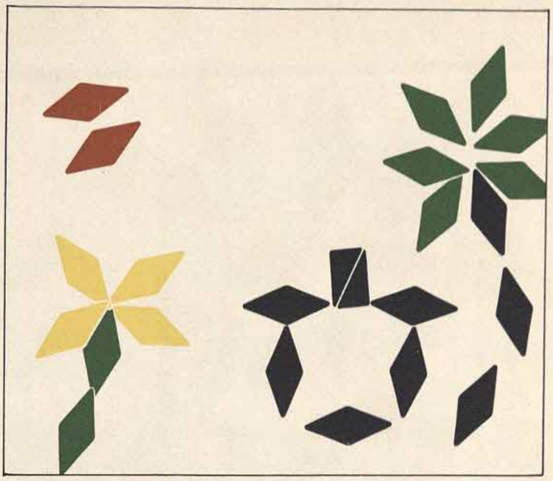


f) Boy R. S. 10 years: rocket and rocket launching station.

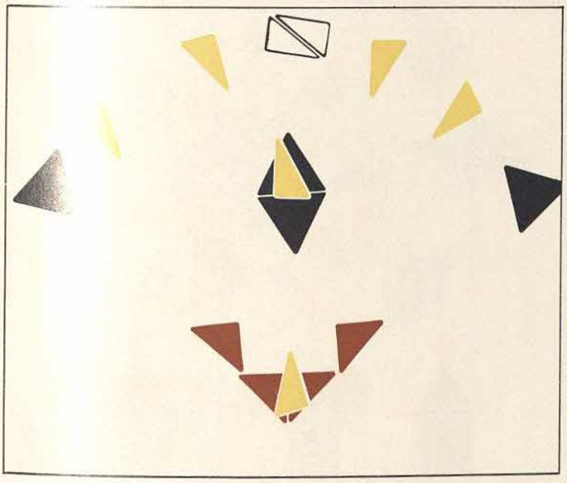
PLATE 26 *Scenes—at increasing ages (3½–10 years)*



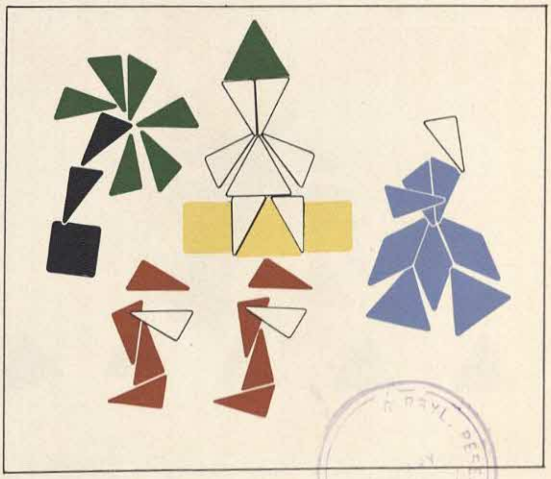
a) Girl U. G. 11 years: picnic scene.



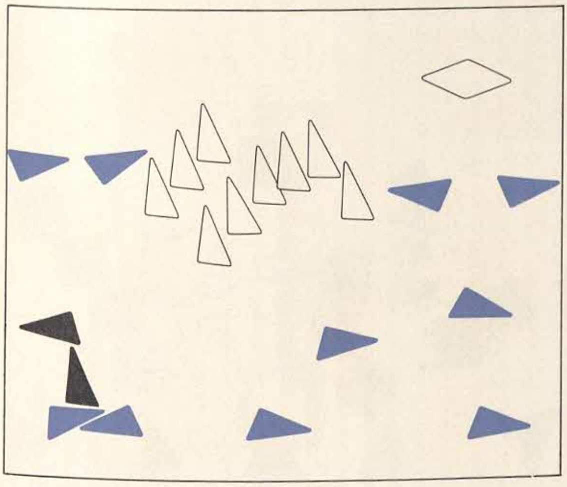
b) Girl J. G. 12 years: flower, tree, house, butterfly.



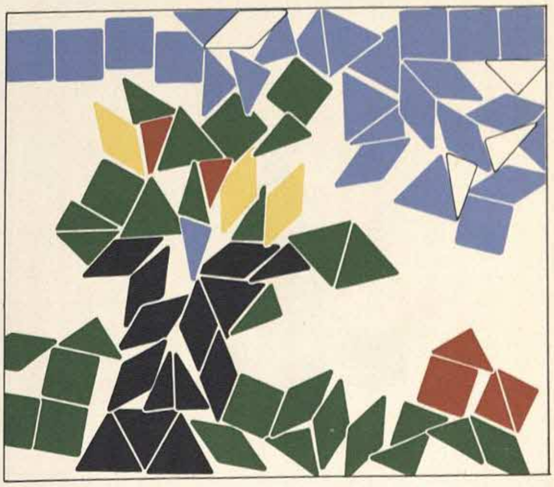
c) Boy C. M. 13 years: baseball diamond and players.



d) Girl K. P. 14 years: wedding of the emperor.

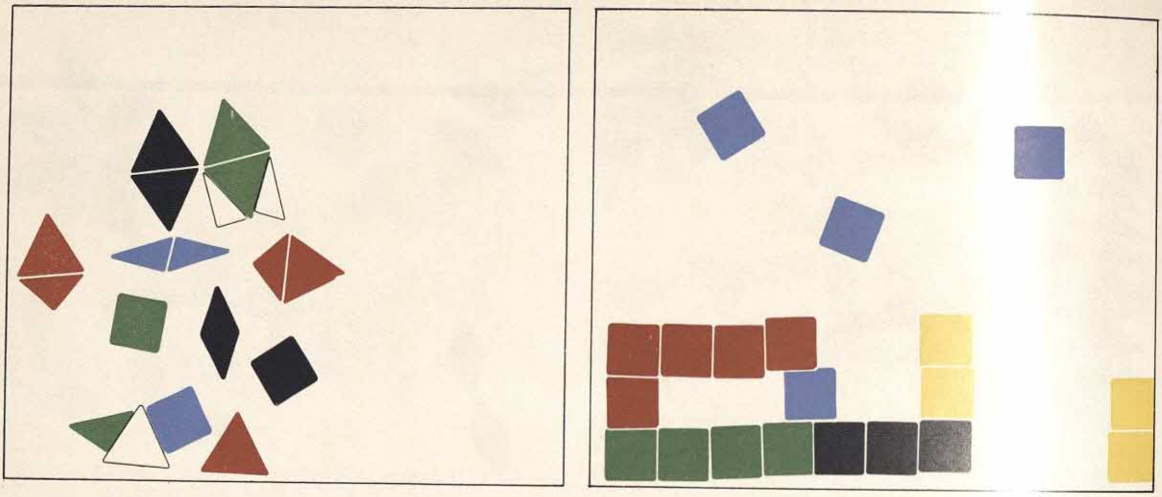


e) Girl M. L. 15 years: sailing regatta.



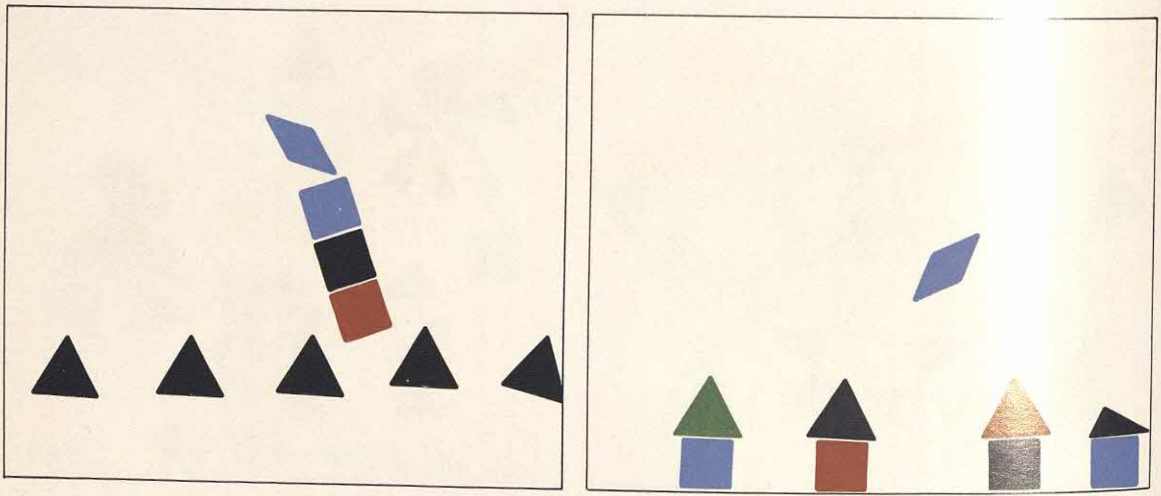
f) Girl N. S. 16 years: tree, green grass, blue sky, red barn.

Scenes—at increasing ages (11–16 years) **PLATE 27**



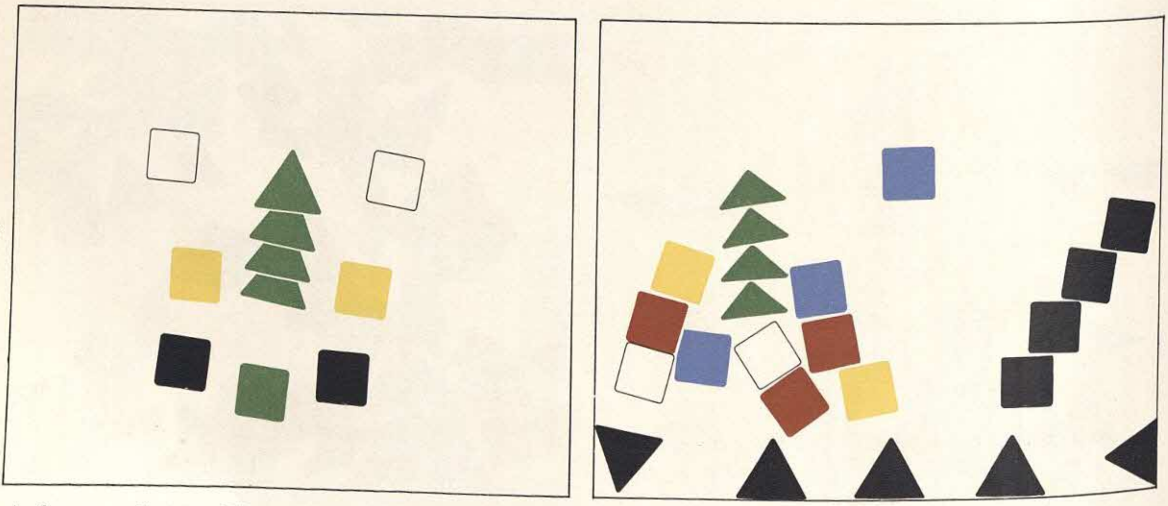
a) 5 years. Object: sign saying 'come in and get coffee ice cream.'

b) 6 years. Scene: house, gate, sky.



c) 7 years. Scene: kite and tents.

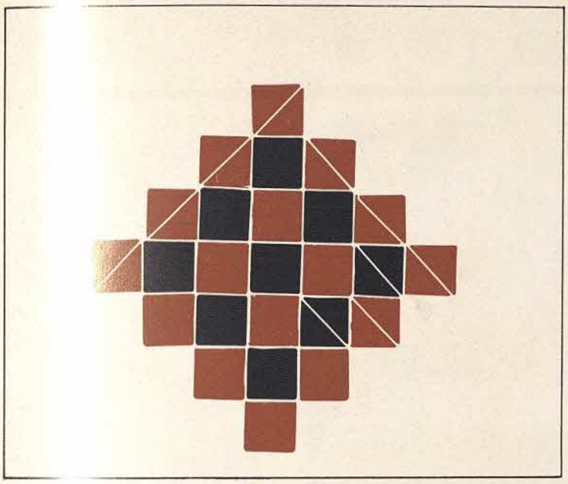
d) 8 years. Scene: houses and kite.



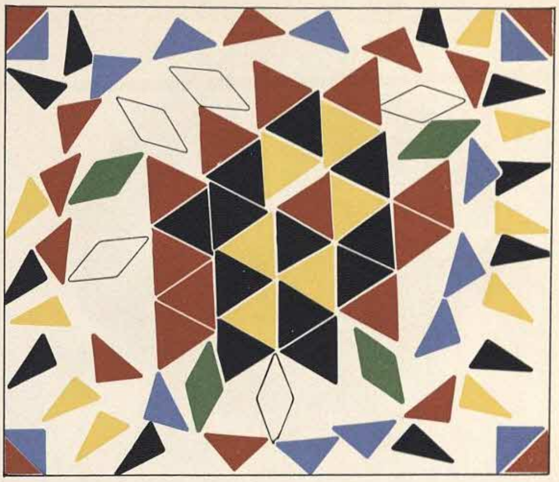
e) 9 years. Scene: Xmas tree and presents, window, and it's snowing outside.

f) 10 years. Scene: Xmas tree and presents, stairs, window, floor.

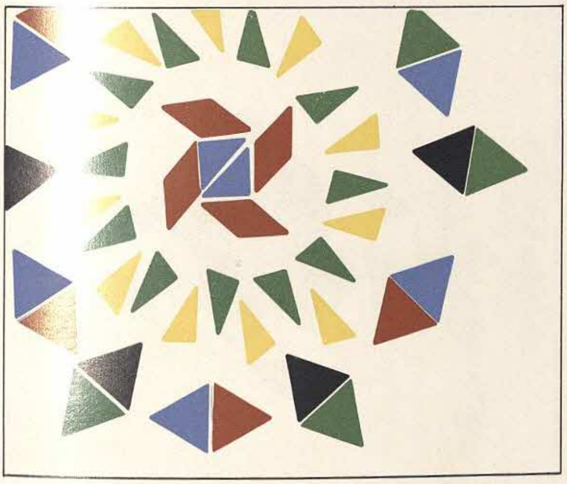
PLATE 28 *Longitudinal individual case, Girl B. I.*



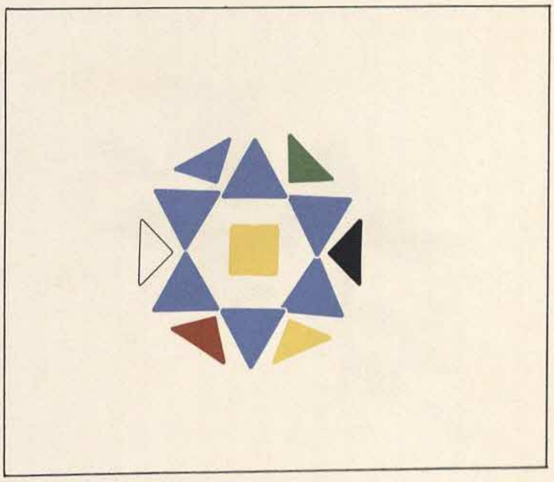
a) 10 years. Central design: design.



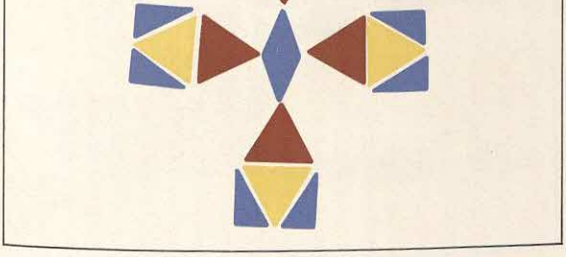
b) 11 years. Central design: design.



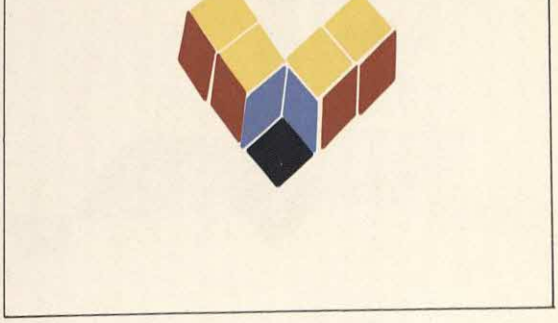
c) 12 years. Design filling tray.



d) 13 years. Central design: design.



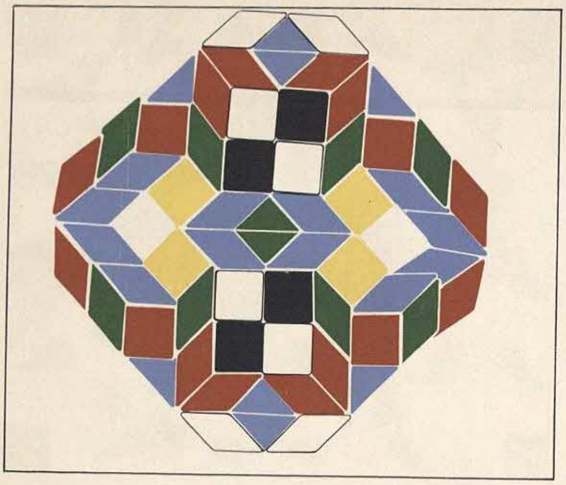
e) 14 years. Central design: effect in depth.



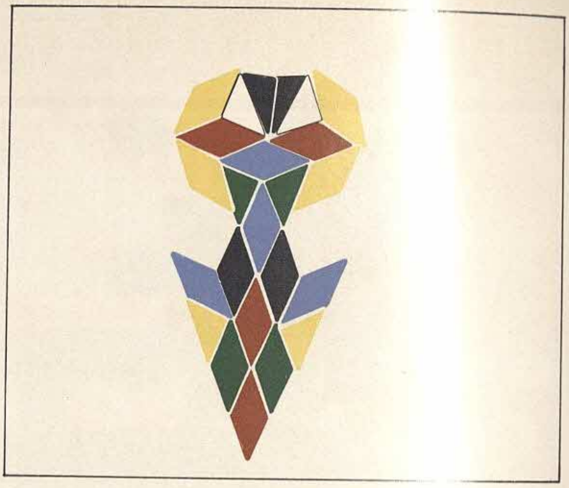
f) 15 years. Objects: four cubes and a shadow.

Longitudinal individual case, Boy D. C.

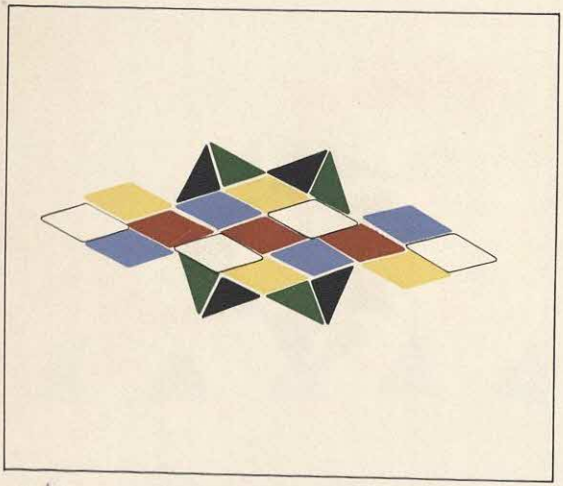
PLATE 29



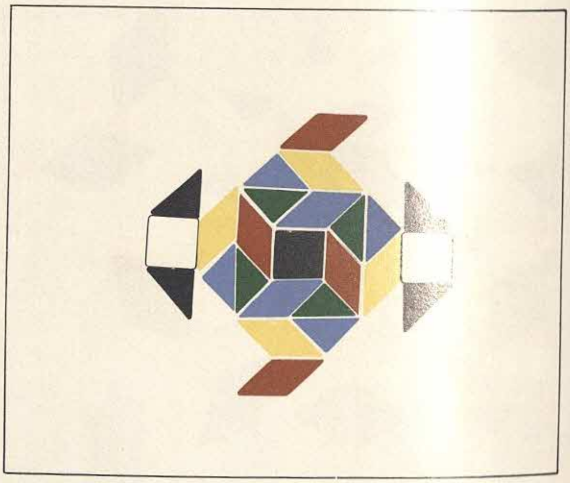
a) 10 years. Central design: design.



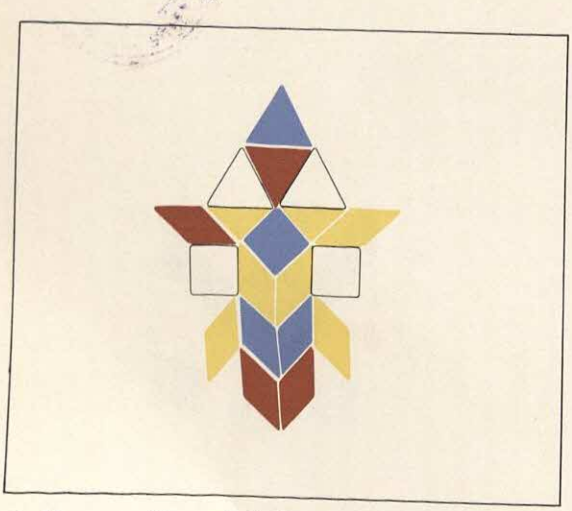
b) 11 years. Object: sort of a flower



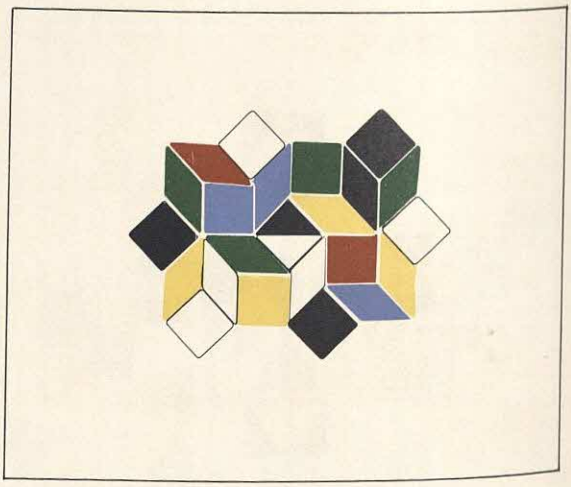
c) 12 years. Central design: design.



d) 13 years. Central design: design.

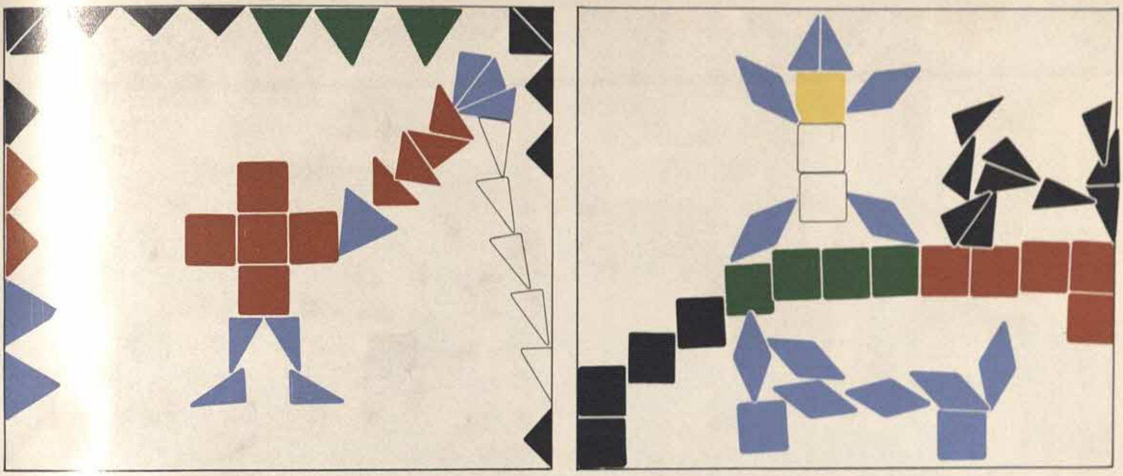


e) 15 years. Central design: design.



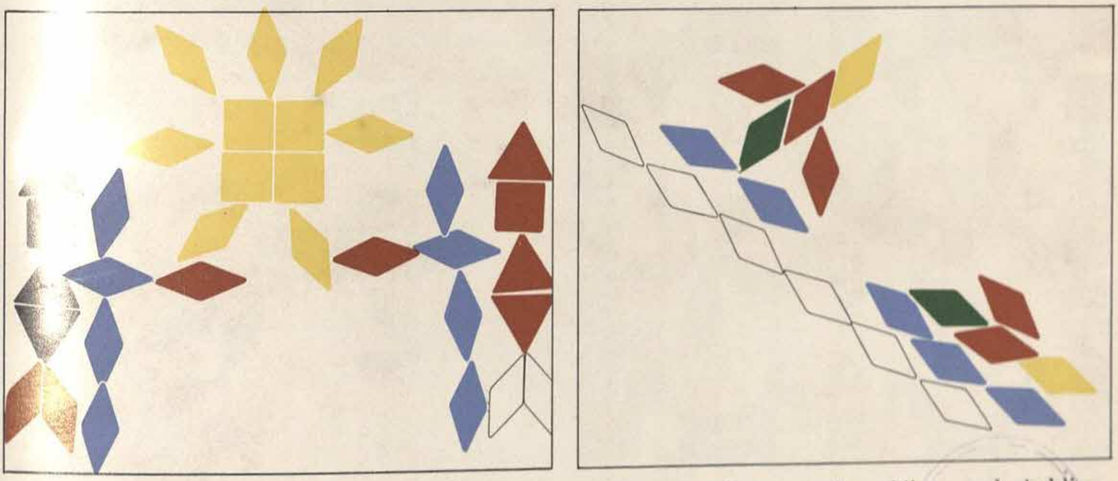
f) 16 years. Central design: design.

PLATE 30 *Longitudinal individual case, Boy D. J.*



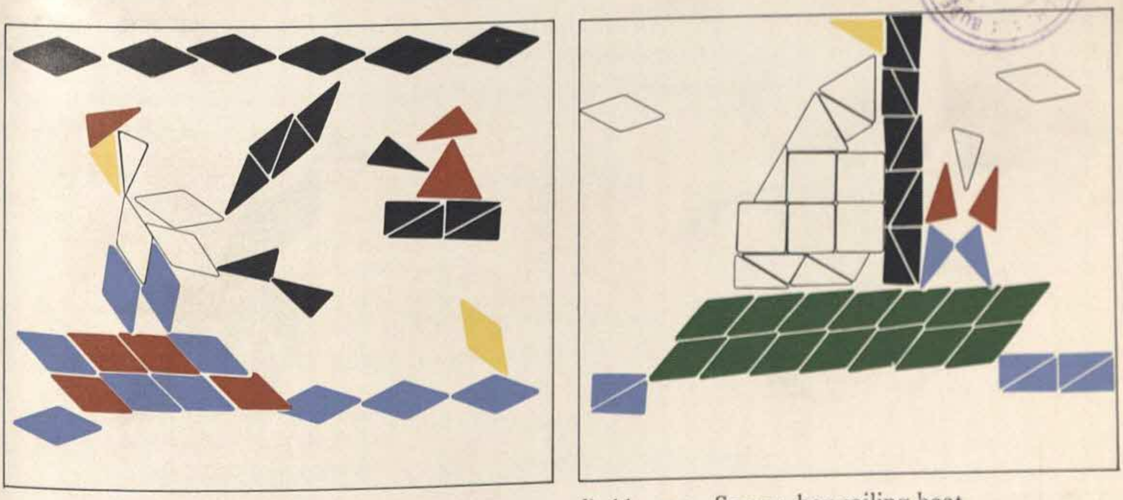
a) 6 years. Scene: boy flying kite.

b) 7 years. Scene: boy going to bed inside house.



c) 8 years. Scene: boys playing guns, sun, posts.

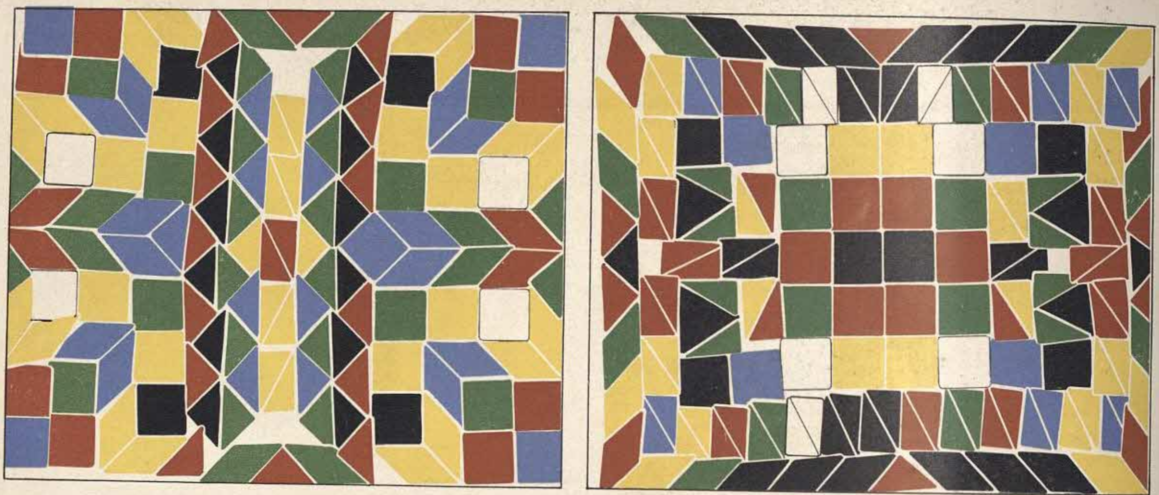
d) 9 years. Scene: twins, skiing, and sledding.



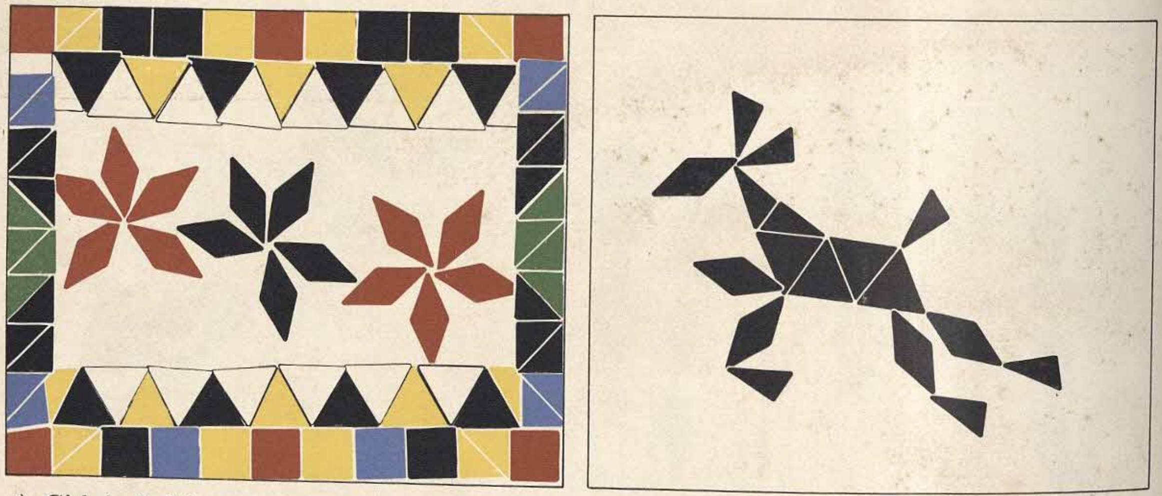
e) 10 years. Scene: men fishing.

f) 11 years. Scene: boy sailing boat.

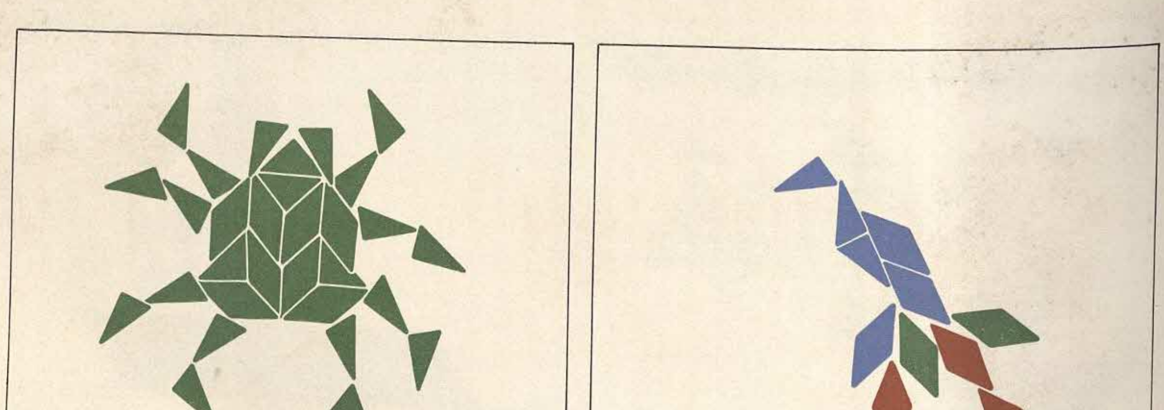
Longitudinal individual case, Boy D. G., gifted boy



a) Girl A. P. 14 years. Overall design: design. b) Girl A. P. 15 years. Overall design: design.



c) Girl A. P. 16 years. Frame and item: design. d) Girl C. R. 12 years. Object: deer.



e) Girl N. C. 13 years. Object: crab. f) Girl N. C. 14 years. Object: peacock.

PLATE 32 *Longitudinal individual cases, neurotic products (a–c) and gifted products (d–f)*

Color. For nonrepresentational products, both build chiefly at level VI. Representational products are varied for both sexes. Girls build most at naturalistic level Va; boys are about evenly divided between IV and Va. As to the colors used, girls use white and black; boys blue, then red.

Naming. As to the level of naming, in girls, scene leads (16); in boys, design named design comes first (15). As to the things named, girls name scene, design, and other building, in that order; boys name design, scene, and abstract, in that order. Sex differences are quite marked, as follows: Girls exceed in scene (16/5), building (10/2), person (6/3), animal (4/1), grass (7/0), and sky (7/3); boys exceed in vehicle (4/8).

Compactness. Boys' products are more compact than are those of girls. Girls have only 16 products at level V of compactness; boys have 26.

Number of pieces. Girls use more pieces than at 15, but boys use about the same number. Girls use many more pieces than do boys.

Timing. Both work more quickly than at 15 years. Both the means (8:45 for girls, 8:47 for boys) and the medians (6:30 for girls, 6:00 for boys) are almost identical for the two sexes.

Symmetry. Boys' products are more symmetrically placed, and more boys than girls make symmetric products.

ACCOMPANYING OR CHARACTERISTIC BEHAVIOR INCLUDING VERBALIZATION

By 16 years of age, the general behavior patterns, as related to the Mosaic, seem quite clearly different for those subjects who may be classed as superior and mature and those of a less great maturity and of lower intelligence.

The latter group (that is, the less well-endowed subjects) seem, on the whole, to approach the task with little enthusiasm; in fact, with considerable apathy and disinterest, more as do typical 15-year-olds, as described in the preceding chapter. Thus their behavior is characterized not only by considerable apathy but by a general vagueness. They seem to have not much idea what to make or how to make it, and not too much interest in the whole affair. Characteristic comments are:

I don't think they lend themselves to making things.
Nothing much you can do with them.
There's not much you can make.
I don't see any sense in this.

Lack of interest and definition is also expressed when they have completed the tests. Thus they make such remarks as the following:

I don't know what I made.
Not satisfied but that's all.
Doesn't look like anything. It might be a star but really it's nothing.

Nothing in particular.
I don't know—just a design.
How long do I have to keep this up?
Do you want me to go on?

Except for such negative remarks, there is surprisingly little verbalization in this group of subjects. Lack of interest in the whole situation may also be being expressed by those who, having earlier made central designs, go back to making slabs at this age.

The behavior of the seemingly better-endowed subjects is, on the contrary, much more enthusiastic and interested at this age (more in keeping with what we think of as typical 16-year-old behavior) than a year earlier. These subjects at this age seem to enjoy the test, seem interested in finding out what it proves about them, and chat enthusiastically with the examiner as they work—both about the test and about unrelated subjects. Thus they may make general friendly conversation about dates, friends, or school; may ask what the test shows about their personality; or may make favorable comment about the test: "This is fabulous! I love to do modern things."

Or they may comment specifically about certain aspects of the test, as about the geometric relationship of the pieces: "Geometry has taught me many things"; or "Have to do something geometric. I take geometry now but I'm not good at it." They also may comment about the abstractness of their own designs.

Many still, even though friendly and positive, seem to find it difficult to accept compliments; they are still rather brittle about this.

Several are so much interested in the perfection of their final product that they improve their design, after it is finished, by changing the colors even after making a reasonably symmetric design.

ILLUSTRATIONS

(SEE PLATE 18)

Girls: a) Central design
b) Scene: Indian sitting cross-legged
c) Scene: boat sailing by island

Boys: d) Central design
e) Object: V-8
f) Scene: chemistry experiment

CHAPTER 24

Developmental Changes in Specific Products

SLABS

The slab pattern, defined by Lowenfeld (1954, p. 99) as a pattern in which a number of mosaic pieces are placed either closely or loosely in juxtaposition to each other, without the creation of an over-all symmetrical shape, is essentially a single pattern and free of the edge of the tray, though slab patterns can be repeated in the same composition, and one or several may be attached to the edge of the tray. When they occur in European subjects, they represent

> either a stage in the development of normal children, or are made by persons during the course of their analysis, or are diagnostic of the presence of emotional disturbance or psychosis in the maker. In collections made in the United States, however, the position is entirely different. There it is found that individuals of good inherent intellectual endowment and satisfactory adjustment to life can make this type of pattern.

Lowenfeld divides the interior structure of slab patterns into five classes:

a. Patterns in which the vast majority of the pieces are juxtaposed in a manner that does not use the geometrical qualities of the pieces.
b. Patterns in which all, or practically all, the pieces are used in a geometrical manner.
c. Patterns in which both modes of use of the pieces occur.
d. Patterns in which interior space occurs.
e. Patterns with a fringe of loose pieces, or in which the ground of the tray appears between the pieces.

Lowenfeld is correct in saying that American investigators do not invariably consider the slab pattern to be an "unsuccessful" product, nor does it appear to be found only in neurotic or unstable subjects. The slab pattern, however, does present a real problem of interpretation. The following analysis of slab patterns found in our collection may throw some light on the subject.

As Lowenfeld suggests, the making of slab patterns appears to represent a normal phase, or, more accurately, normal *phases* in child subjects. The tabular

Table 31

TABULAR SUMMARY, AGE CHANGES IN SLAB PATTERNS

4 years:	Slabs are made by 3 subjects—*1 girl and 2 boys.*
	Size ranges from 6 to 12 pieces.
	Fit ranges from a mere coagulation of adjacent pieces to quite good fit with pieces close together.
	Judged aesthetically, 1 of the 3 is pleasing and 2 are questionably pleasing.
5 years:	Slabs are made by *5 girls and 4 boys.*
	Size ranges from 5 to 95 pieces, boys' slabs being larger than girls'.
Girls:	Three of the 5 are a coagulation of adjacent pieces; 2 have pieces which do fit on one or on several sides.
Boys:	Pieces of all slabs fit at least in places, on one or more sides.
	Six are pleasing, one questionable, and two not pleasing.
6 years:	Slabs are made by *2 girls and 3 boys.*
	Size ranges from 11 to 25 pieces.
	Great variety of fit, ranging from no fit, through fitting on one side only, to many pieces fitting on several or all sides.
	Slabs are judged aesthetically pleasing (3), questionable (2).
7 years:	Slabs are made by *1 girl and 2 boys.*
	Size ranges from 6 to 60 pieces.
	Though fit is not perfect, there are many good islands of form, and many pieces fit on all sides.
	Of these slabs, 2 are questionably pleasing, 1 unpleasing.
8 years:	Slabs are made by *5 girls and 4 boys.*
	Size ranges from 11 to 54 pieces.
Girls:	Many or all pieces fit on all sides with good islands of form.
Boys:	Pieces fit on several or all sides, with good islands of form. Slab is becoming slightly linear.
	Slabs are considered pleasing (1), questionably pleasing (6), unpleasing (2).
9 years:	Slabs are made by *6 girls and 5 boys.*
	Size ranges from 8 to 72 pieces.
Girls:	The very best ones have pieces which fit on all sides. More characteristic is for many pieces to fit on most sides.
Boys:	Like girls, some have some or all pieces fitting on all sides. The majority have most pieces fitting on some sides. Some have good islands of form.
	Of these patterns, 4 are considered pleasing, 4 questionably pleasing, 3 not pleasing.
10 years:	Slabs are made by *7 girls and 4 boys.*
	Size ranges from 6 to 40 pieces.
Girls:	Most fit on all or many sides, though there are some of which we can say only that many pieces fit on all sides.
Boys:	Do less well. Most pieces fit on only one or two sides.
	Of these slabs, 3 are rated pleasing, 5 questionable, 3 not pleasing.
11 years:	Slabs are made by *6 girls and 3 boys.*
	Size ranges from 14 to 70 pieces.
Girls:	Many or most pieces fit on all sides in the majority of girls.
Boys:	Many pieces fit on all sides, though not always too accurately.
	Of these patterns, 3 are considered pleasing, 2 questionably pleasing, 2 unpleasing.
12 years:	Slabs are made by *5 girls and 6 boys.*
	Size ranges from 8 to 61 pieces.

Table 31 (Continued)

Girls:	Most pieces fit on all sides, except in the most spaced-out patterns.
Boys:	Most pieces fit well on all sides.
	Of these slabs, 2 are judged questionably pleasing and 8 unpleasing. Only 1 is judged pleasing.
13 years:	Slabs are made by *7 girls and 1 boy.*
	Size ranges from 18 to 73 pieces.
Girls:	The fit is less good than at 12 years. Fit is very variable.
	Pattern is becoming a little more open and less accurate.
Boys:	Now many rather than most fit on all sides.
	Of these patterns, 3 are judged pleasing, 3 questionable, 1 unpleasing.
14 years:	Slabs are made by *2 girls and no boys.*
	Size ranges from 28 to 56 pieces.
	Most pieces fit well on all sides, but slab is becoming slightly more open.
	Of these, 1 is pleasing, 1 questionably pleasing.
15 years:	Slabs are made by *2 girls and 2 boys.*
	Size ranges from 18 to 24 pieces.
Girls:	Most pieces fit on all sides, though slab is becoming more open.
Boys:	Most pieces fit on all sides. Boys' slabs are more compact than those made by girls.
	Of these slabs, 1 is judged aesthetically pleasing, 2 questionably pleasing, 1 unpleasing.

summary in Table 31 lists and describes typical age changes in slab patterns. Plate 20 illustrates typical slab patterns at increasingly mature ages—6, 8, 11, 12, 15, and 16 years.

As this summary shows, slabs are first seen at 4 years of age, at which time they are small in size and vary from mere coagulations of adjacent pieces to a moderately good fit which indicates a rather advanced ability at manipulation for the age. As Table 31 indicates, there is a rather good variety of both colors and shapes, suggesting that a selective ability is already at work.

At 5 years of age, 9 per cent of our subjects make slab designs, which may be considered a "good" or successful response at this age. Some subjects achieve little in the way of fit, slab patterns being little more than a coagulation of adjacent pieces. But the typical slab at this age is made of pieces which fit adjacent pieces, more or less well, on at least one side.

A slab may be considered a "good" response at 6 years, also, though other more complex patterns are now coming in strongly. At 7 years, only 3 subjects make slabs. The typical slab at this age not only is made up of many pieces which fit on more than one side, but also contains islands of form.

Though slab patterns thus appear to occur as a normal stage of development, at least from 4 to 6 years of age, the most conspicuous occurrence of slabs in our subjects is from 8 through 12 years of age, with an average of approximately 10 per cent of subjects at each of these ages making slab patterns.

Our evaluation of these patterns is made not on the mere basis of their being slabs (that is, we do not consider slabs, as such, as either "successful" or "unsuccessful" patterns); rather, we judge by their quality. As Table 32 shows, from 8 years following, with few exceptions (boys at 12 and girls at 13 and 15 are exceptions) the mean subject uses all colors and all shapes in his slab design. This suggests an impressive degree of careful selection. The slab pattern is not constructed at random. In evaluating any slab pattern during this age period, the variety of shapes and colors used should be considered.

Accuracy of fit should also be kept in mind. Even by 7 years of age, as the tabular summary shows, many pieces fit, some of them on all sides, and islands of form appear. By 9 years of age, in girls, many pieces fit on most sides; by 10 years, most pieces fit on many sides; by 11 years, many or most fit on all sides; and by 12 years most fit on all sides. Boys' slabs, in general, fit slightly less well than do those of girls.

After 12 years of age, very few slabs are made by the present subjects, and after 15 there are none. Slabs, at least those made by our subjects, are slightly less good in fit at 13 than at 12 years. There is a tendency for slab patterns to be more spaced out and slightly more open (see Plate 20) from 13 to 15 years of age than earlier.

NUMBER OF SLABS

Table 13 and Table 31 indicate the extent to which slab patterns were made, by sex and by age. As these tables show, such patterns occur conspicuously at 5 years of age (at which time we suspect that they do not have adverse significance but merely represent a developmental phase of exploratory manipulation of available pieces) and again from 8 through 12 years. Slabs are not made to any extent after 13 years of age by our subjects. (The per cent of incidence of slabs in a population of subjects other than those used in this study is quite different from the present figures. This suggests that the making of slabs may be more an individuality than a typical growth factor, and that their significance is more important as an indicator of individuality than of developmental status.)

DIFFERENT SHAPES AND COLORS

Analysis shows that, as often as not from 8 years on, *all or nearly all different available shapes and colors* are used in the individual slabs. If there were, as first glance sometimes erroneously leads us to suspect, absolutely no plan or order to the slab production, it seems unlikely that individual slab patterns would include such a good variety of shapes and colors. Thus, though the final pattern may not appear to be well planned and shapely, considerable careful selection has already gone into its production. The mean number of colors and shapes used, by sex and by age, are indicated in Table 32. (It is possible to use six different colors and five different shapes, if all are used.)

With few exceptions, boys from 7 years and girls from 8 years use all colors and all shapes. The variety of both falls off in boys at 12 and in girls at 13 and 15. As to the special colors used, from 8 years and following, most children use all colors. Black and blue pieces are used especially by 5-year-olds; 6-year-olds use

Table 32

MEAN NUMBER OF SHAPES AND COLORS USED

Age in Years	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*11*	*12*	*13*	*14*	*15*
Girls	6C, 4S*	3C, 3S	5C, 4S	4C, 4S	6C, 5S	5C, 5S	6C, 5S	6C, 5S	6C, 4S	5C, 4S	6C, 5S	5C, 4S
Boys	4C, 4S	5C, 5S	5C, 4S	6C, 5S	6C, 5S	6C, 4S	6C, 5S	6C, 5S	5C, 4S	6C, 5S	—	6C, 4S

* C = color; S = shape.

black and white least; 7-year-old girls are low on white and yellow, but boys use all colors.

After 8, the few outstanding exceptions to the use of all colors are boys at 12, who tend to omit black, and 13-year-old girls, who use white the most, black and green the least.

SIZE OF PRODUCT

The number of pieces used in slabs is reported in Table 33, both the means and the medians being given. The trends appear to be extremely irregular. In general, girls' Mosaics tend to increase in size irregularly through 14 years, the high points occurring at 11, 12, 13 and 14. Boys' mosaics increase in size through 11 years and then decrease. Their high points occur at 5, 7, 10, and 11 years.

Table 33

NUMBER OF PIECES USED IN SLABS

	Girls		*Boys*	
Age in Years	*Mean*	*Median*	*Mean*	*Median*
4	12.0	12.0	9	9.0
5	9.6	8.0	49	49.0
6	15.5	15.5	19	17.0
7	6.0	6.0	36	36.0
8	36.0	34.0	33	34.0
9	31.0	30.0	22	21.0
10	28.5	28.0	31	35.5
11	39.0	42.0	34	33.0
12	45.0	57.0	20	19.0
13	37.0	26.0	27	27.0
14	42.0	42.0	—	—
15	20.5	20.5	21	21.0

A slightly different method of measuring size was to rate each slab pattern as small (containing 12 or fewer pieces), medium-sized (13 to 35 pieces), or large (36 pieces or more). The results of this rating appear in Table 34. Very large slabs are made most from 8 through 13 years.

SLABS OPENING UP

In addition to there being a slight though extremely irregular tendency for slab patterns to become larger with increased age of the subject, there is a very slight tendency for them to become more open and sprawling with age.

Table 34

SIZE OF SLAB PATTERNS

Age in Years	*4*			*5*			*6*			*7*			*8*			*9*			*10*			*11*			*12*			*13*			*14*			*15*		
	S	*M*	*L*	*S*	*M*	*L*	*S*	*M*	*L*	*S*	*M*	*L*	*S*	*M*	*L*	*S*	*M*	*L*	*S*	*M*	*L*	*S*	*M*	*L*	*S*	*M*	*L*	*S*	*M*	*L*	*S*	*M*	*L*	*S*	*M*	*L*
Girls	1	0	0	4	1	0	1	1	0	1	0	0	0	2	3	2	2	2	0	6	1	0	2	4	0	2	3	0	4	3	0	1	1	0	2	0
Boys	2	0	0	1	1	2	0	3	0	1	0	1	1	1	2	2	2	1	0	1	3	0	2	1	3	3	0	0	1	0	0	0	0	0	2	0

Even as early as 8 years of age, and increasingly thereafter, islands of space appear between groups of slabs; or, in some instances, the over-all slab pattern, instead of being primarily compact, becomes—at least in places—quite linear, spreading out over a good portion of the board, with unfilled spaces between the separate tendrils.

AESTHETIC APPEARANCE

Lowenfeld seems to consider slab patterns as quite generally ugly and non-pleasing in appearance, but she does comment that not all American workers consider American-made slabs to be ugly. In fact, some of the latter appear to feel that at least some of the slabs made by their subjects are pleasing to the eye.

This is, of course, a *very* subjective matter, and we have not pursued it far. We did, however, review our total group of 83 slabs, rating each as + (pleasing), ± (questionably pleasing), and — (unpleasing to the eye), depending on color combination, total over-all shape, and accuracy or inaccuracy of fitting of pieces. In all, slabs made by girls were rated as 21 pleasing, 19 questionably pleasing, and 8 not pleasing; those of boys were 7 pleasing, 13 more or less pleasing, and 15 not pleasing. (See Table 31.)

The more pleasing slabs occur at 4 to 6 and at 13 to 15 years, the less pleasing from 7 to 12 years.

FITTING AND PATTERN

Another dimension of slab production which we have investigated is the matter of fitting of pieces. This, again, is a rather difficult evaluation to make, since, in most slabs, *some* pieces fit and there are, either intentionally or inadvertently, islands of pattern. (These are actually two different factors, since several or many pieces in a slab may fit without necessarily producing any substantial islands of pattern.) Variables are innumerable, and variation is tremendous. Again, we have made a simple analysis as to degree of fitting: +, pieces all fit (not necessarily do all fit perfectly on every side, but each piece fits at least one adjacent piece); ±, some pieces fit; —, no or virtually no pieces fit.

The analysis in Table 35 suggests, perhaps surprisingly, that among our collection of slabs there are very few in which no or virtually no pieces fit. Relatively more girls than boys make slabs of reasonably good fit. The fit, in general, seems a little less good in boys at 10 and in both sexes at 13 years, but it improves definitely in the few slabs made at 14 and 15 years.

As will be seen from Plate 20, some slabs, though they do not carry out a clear-cut pattern, are of surprisingly good fit.

SLABS AT MORE THAN ONE AGE

Slab patterns at more than one consecutive age are made by 8 children—4 girls and 4 boys: 1 at 4 and 5 years; 1 at 5 and 6; 1 at 6, 7, and 8; 1 at 10 and 11;

Table 35

Fitting of Pieces in Slab

Age in Years	*4*			*5*			*6*			*7*			*8*			*9*			*10*			*11*			*12*			*13*			*14*			*15*			*Totals*		
	+	±	−	+	±	−	+	±	−	+	±	−	+	±	−	+	±	−	+	±	−	+	±	−	+	±	−	+	±	−	+	+	−	+	±	−	+	±	−
Girls	0	0	1	2	2	1	1	1	0	0	1	0	4	1	0	2	4	0	6	1	0	4	2	0	4	3	0	3	3	0	2	0	0	2	0	0	30	18	2
Boys	1	1	0	2	2	0	1	1	1	1	1	0	2	2	0	3	1	1	0	4	0	2	1	0	5	1	0	0	1	0	0	0	0	2	0	0	19	15	2

1 at 10, 11, 13, and 14; 1 at 11 and 12; 1 at 13, 14, and 15; and 1 at 12, 13, and 15. A slab pattern in any one child, however, tends most often to be a one-age affair. Of the 84 slabs in our series, only the 8 subjects listed above make more than one slab.

NEUROTIC PERSONALITY

Although the present study, being a normative investigation, does not, to any extent, deal with personality patterns as revealed by the different types of Mosaic patterns made, in view of the special question as to whether or not the making of a slab indicates a neurotic personality, we have given brief consideration to this problem. All makers of slab patterns who were well enough known to the investigators to make such an evaluation practical, were rated as +, presumably normal; ±, questionable; and —, probably neurotic. Of our subjects so rated, we find that girls were rated 18+, 8±, and 6—. Of the boys, there were 15+, 8±, and 4—. Thus presumably normal subjects clearly prevail among slab makers.

SUMMARY

It appears that the slab pattern may have two quite different meanings when considered as representing a developmental stage or stages in the maturing of children's patterns, or as an indication of a possibly neurotic personality in the mature adult. Even in child subjects after, if not before, 13 years of age, a slab pattern may have a somewhat adverse implication in regard to personality. Certainly, it must be interpreted differently from a complex successful design or scene, though, in our present population, slab patterns are frequently made by reasonably well-adjusted, nonneurotic subjects. Our present interest is developmental, however, and, developmentally, it must be stated that the slab pattern, as such, does not have a conspicuously adverse implication; rather, any given slab must be judged according to such norms as are at present available. (See Table 31.)

Slabs occur, in our present subjects, most at 5 years of age, and again from 8 to 12 years. There are few after 13.

Little or no fit is expected at 4 and 5 years of age, but by 6 or 7 years there should be at least some good fitting, at least on single sides if not on several sides, and also there should preferably be small islands of form. At 8 to 10 years, many pieces should fit on most sides. From 11 years on, many or most pieces may be expected to fit on many or all sides.

Slabs thus may be judged as good or bad depending on whether or not the degree of fit meets or fails to meet the norms for the age. They may also be judged by the number of colors and number of shapes used. At the earlier ages we may assume that the greater variety the better, since from 7 years on (in boys) and from 8 years on (in girls) the majority may be expected to use all available shapes and all colors. As the child grows older, however, once again there is a slight tendency for the number of different colors and different shapes used in a slab to diminish. This probably implies increased selectivity. In fact, though a certain amount of selectivity is indicated when a child includes all colors and all shapes in a slab, such a product implies a lack of ability to narrow down to only certain shapes or colors. Slab patterns may also be judged as to their aesthetic pleasingness or unpleasingness, but this is, inevitably, a somewhat subjective matter.

As to size, individual variation is great, and, in our opinion, fit, aesthetic pleasingness, and the variety of colors and shapes used are probably more important than size. Considering the rather large means and medians for both sexes at ages after 7, however, it seems safe to say that, after that age, a slab pattern made of fewer than 12 pieces, unless of unusually good fit, might be judged a somewhat inadequate performance. In general, the slab does get larger with increased age, and in many cases it becomes somewhat more open or spread out.

The secret of the slab does not appear to be fully revealed as yet. Individual variation as well as basic lack of pattern combine to cloud the picture, but our analysis does suggest, as Plate 20 shows, that the typical slab pattern, as seen in our subjects, especially after 8 years of age and often earlier, may be made up of all available colors and shapes, may include a good deal of extremely careful fitting of pieces, may contain good spots or islands of pattern, and may be pleasing to the eye.

There is some suggestion that slab patterns may be made, at least in some instances, by subjects who approach the Mosaic task not with preconceived ideas but rather with an attitude of letting the materials, to some extent, decide what the product shall be. This could conceivably indicate a fairly high degree of creativity quite as much as a neurotic or shapeless personality.

At the younger age levels, at least, the making of slab patterns may indicate merely immaturity and lack of familiarity with and ability to manipulate the material. At other ages, as at 12 years, the slab pattern might be considered as being expressive of certain personality characteristics which we have come to associate with the 12-year-old child—exuberance, energy, enthusiasm, and a certain shapelessness.

The fact, however, that in a different population of subjects we find a quite different incidence of slab patterns suggests that the slab may be significant more as an indication of a certain type of individuality than as an indicator of developmental status.

CENTERS

One aspect of patterned, nonrepresentational designs which Lowenfeld considers especially significant in revealing personality factors in the maker is the kind of center which the design features.

A review of present data reveals relatively little that is consistent or significant from a developmental point of view, so centers will be treated here only briefly.

It does appear that, at the earlier ages, designs do not include clear-cut center areas. Thus, even by 7 years of age, designs of only 2 girls and of 1 boy show clear-cut centers. Two of these centers are basic 4-year-old circles made of 6 large triangles each; 1 is an empty enclosed area.

Gradually, however, the number of subjects making designs with centers increases until, in our population, by 13 and 14 years of age approximately one-third of all subjects make designs with clearly designated center areas. Thus, at 13 years of age, 36 children (18 girls and 18 boys) make good centers. Since, at this age, only 44 subjects make nonrepresentational patterned designs, this means that nearly all such designs do have definite centers.

Although a few of these centers, at most ages, are extremely individual, the majority can be classed as empty (white, or a piece set in space); red; black; a square made of 1 square, a square made of 4 squares, or a square made of 2 triangles; a basic 4-year-old circle made of 6 large triangles; a triangle; or a diamond made of 1 diamond or of 2 large triangles.

The significance of all these is not self-evident, but the meaning of an empty or white center, a red or black center, or a solid square center is not difficult to interpret, and some investigators consider the diamond shape to be of sexual implication.

Table 36 tabulates centers observed in designs of our 8- to 16-year-old subjects.

AGE CHANGES

Age changes in type of center are neither consistent nor striking. It can be noted, however, that the number of patterned designs with clear-cut centers increases with age. Empty centers increase with age, except that there are more at 13 and 15 years than at 14 and 16. Red centers occur most at 14 to 16 years; black most at 10, 12, 13, and 16 years; squares most at 10, 13, and 16 years; and diamonds most at 12, 14, and 16 years.

SEX DIFFERENCES

Consistent sex differences are very few. Girls do have more red centers than boys do at seven of the ages from 8 to 16 years, when most clear-cut centers are made. Girls have more square centers than do boys at seven of the nine ages. Girls have more white or empty centers than do boys from 9 to 12 years and at 15 years. Boys have more diamond centers than do girls at five of the ages; girls more than boys at three of the ages.

HOUSES

Houses occur conspicuously among the subjects of the present study. In fact, they represent the largest single specific content category, being surpassed only by design and scene. There are, in all, 188 houses—85 made by girls, 103 by boys. If combined with the 98 other buildings, they occur even more frequently than

Table 36

CENTERS

Age in Years	8		9		10		11		12		13		14		15		16	
	G	*B*	*G*	*B*	*G*	*B*	*G*	*B*	*G*	*B*	*G*	*B*	*G*	*B*	*G*	*B*	*G*	*B*
Nonrepresentational pattern designs*	17	10	21	11	17	13	18	12	25	15	24	20	24	23	23	26	18	28
Designs with clear-cut centers	8	6	11	5	13	10	11	6	17	13	18	18	14	18	19	17	16	16
Type of center:																		
White, empty, or piece set in space	3	3	3	0	5	1	4	2	7	3	6	10	5	5	11	9	7	7
Red	1	2	1	0	2	1	3	1	0	3	3	1	3	2	5	1	4	0
Black	0	3	2	0	1	4	0	0	3	2	1	4	0	3	2	2	4	2
Square	3	2	6	2	6	8	7	1	5	3	9	7	4	8	7	5	9	7
Four-year-old circle of triangles	1	0	1	1	0	0	0	1	1	4	3	1	4	1	1	3	1	3
Triangle	0	1	1	0	4	2	0	0	0	0	0	1	1	0	0	0	1	1
Diamond	1	2	1	2	0	0	3	1	3	5	4	2	3	8	7	0	4	5

* This includes all types of nonrepresentational design with pattern, not just central designs.

do scenes, being surpassed only by design and by the total group of products unnamed. Since there appeared to be little difference between the method of constructing houses and other buildings, we present here only an analysis of houses.

Houses occur increasingly from 2 through 7 years and then, with very minor exceptions, fall off steadily. The high points, therefore, run from 5 years (25 houses), through 6 years (28 houses), 7 years (33 houses), and 8 years (23 houses). Girls make more houses than boys do at 3, 4, 8, and 12 years; boys at all other ages exceed girls, with the exception of 14 years, when the figures are equal.

Individual differences among the many houses constructed at most ages are marked, and thus our determination of the developmental sequence is somewhat subjective, but a rather clear-cut developmental sequence does occur, as appears in Tables 37, 38, and 39 and in Plate 21.

Table 37

DEVELOPMENTAL STAGES IN CONSTRUCTION OF HOUSES

1. Mere scattering of pieces, named "house"
2. Single pieces, named "house"
3. Slab, named "house"
4. Two-piece house made of square capped by triangle, 1 only
5. Small compact house of 2 to 4 squares, usually with roof
6. Large open house made of squares, usually with window, door, and roof
7. Two-piece house of square and triangle, with a chimney (usually made of scalene)
8. Two or more 2-piece square-plus-triangle houses in a row
9. Solid square structure made of 9 or more squares
10. Complex houses made of many pieces, cleverly fitted
11. Structure resembling adult schematic drawing of a house

Typical houses, as seen at different ages, are illustrated in Plate 21 as follows: (a) 2-piece house and small compact house, 5 years; (b) 2-piece house with chimney, 6 years; (c) open square house, 7 years; (d) solid square structure, 10 years; (e) complex fitted house, 13 years; (f) structure as drawn by adult, 16 years.

TREES

One of the earliest, most frequent, and most successful single objects which children make with the Mosaic chips is a tree. Except for boys at 11 and 12 years, boys and girls both make what they call trees at every age from 3 through 16 years. At nearly every age girls make more, usually many more, than do boys. The high points for the production of trees are at 8, 14, and 16 years.

The resemblance of the products made to actual trees, as Table 40 describes, is limited at 3 and 4 years, nor are the colors correct. From 5 years on, however, the majority of "trees" not only resemble trees but consist of black trunks and green leaves. Not until 15 and 16 years are different colors used by some along with the green leaves. (Exceptions are that so-called "Christmas trees" bear colored "presents" at 4, 5, and 10 years.)

Table 38

HOUSES

Age in Years	*2*		*3*		*4*		*5*		*6*		*7*		*8*		*9*		*10*		*11*		*12*		*13*		*14*		*15*		*16*	
	G	*B*	*G*	*B*	*G*	*B*	*G*	*B*	*G*	*B*	*G*	*B*	*G*	*B*	*G*	*B*	*G*	*B*	*G*	*B*	*G*	*B*	*G*	*B*	*G*	*B*	*G*	*B*	*G*	*B*
Two-year-old scattering and naming	2	4	1	0																										
Single pieces, named "house"	—	—	2	2	1	1	—	—	—	—	0	1																		
Slab, named	—	—	2	1	3	1	2	3																						
Two pieces	—	—	—	—	1	0	1	2	1	1	1	4	0	0	0	1	0	0	1	2	1	0								
Small, solid	—	—	—	—	—	—	3	2	1	1	3	1	1	1	2	0	0	0	0	0	0	0	0	0	1	0				
Open square house	—	—	0	1	2	0	0	2	7	5	1	3	2	3	1	1	0	0	1	1	0	0								
Two-piece with chimney	—	—	—	—	1	0	2	0	3	4	0	0	2	0	1	0														
Two or more 2-piece houses in a row	—	—	—	—	—	—	3	1	0	2	4	5	4	3	1	3	1	1	0	0	2	0								
(All 2-piece)	—	—	—	—	(2	0)	(6	3)	(4	7)	(5	9)	(6	3)	(2	4)	(1	1)	(1	2)	(3	0)								
Solid square structure	—	—	—	—	0	1	0	2	0	1	2	5	3	1	1	1	1	4	0	0	1	2	1	2	1	0	1	1	0	0
Complex fitted house	—	—	—	—	—	—	—	—	1	0	0	0	1	2	—	—	—	—	—	—	—	—	—	—	0	2	0	1	1	2
Structure as drawn by adult	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0	1	0	1
Variations	—	—	2	0	0	2	0	2	0	1	0	0	0	0	0	1	0	0	0	0	1	0	0	1	0	0	1	0	0	0
Totals	2	4	7	4	8	5	11	14	13	15	11	19	13	10	6	7	2	5	2	3	5	2	1	3	2	2	2	3	1	3

Table 39

FURTHER DETAIL OF AGE CHANGES IN HOUSE STRUCTURE

	Years	
	Girls	*Boys*
Simple house of square capped by triangle; same with chimney; or row of 2-piece houses with or without chimney		
Alone, no additions	4, 5, 6, 7	5, 6, 7, 8
Grass or shadow at base of structure	8	—
Path or walk added	9–12	9–11
Kind of roof used with house made of squares		
No roof	—	4
Roof of squares or triangles, no special formation	7	5–8
Alternating rows of triangles—first base up, then peak up	8, 9	9
Several rows of triangles topped with either square or triangle	12	10–14
Even more complex and fitted	13–15	15

Age changes in predominant patterns are described in Table 40 and are illustrated in Plate 22.

FLOWERS

Flowers are made by 33 girls but by only 6 boys in the entire age range. They occur first, very minimally, at 4 years (1 boy) and at 5 years (1 girl and 1 boy). The high points are 6 girls at 11 years and 4 girls at 14.

Except at 4 years, when the "flowers" so named are merely large blue triangles, and at 5, when the girls' "flower" is 3 large red triangles grouped and the boys' is a basic circle of 6 large yellow triangles, "flowers" so named bear a remarkably good resemblance to real flowers, from the earliest ages on. Even 6- and 7-year-olds' flowers clearly look like flowers, in both color and form. By 10 years they reach an extremely mature form, being made, characteristically, in the form of circles constructed of 8 diamonds each. From this age on, little of new basic structure enters, though interesting individual differences appear, as Plate 23 illustrates.

PEOPLE

There are, for all ages combined, 107 people and 27 faces made by the present subjects. At no age do more than 5 subjects make faces, though the number of persons made rises as high as 14 at one age (15 years). The single category person, as well as the combined categories of persons and faces, is fifth in frequency of all content categories, but faces alone occur infrequently enough to be considered somewhat exceptional. For the most part, more boys than girls make people from 3 through 10 years. The figures are equal at 11, but more girls than boys make people from 12 through 16 years.

Table 40

TREES—TABULAR SUMMARY OF LEADING PATTERNS

3 years: 3G, 2B

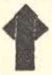
Chiefly single pieces names "tree." Pieces may be of any color. A group of pieces, all different colors, names "tree," but no resemblance.

4 years: 1G, 2B

Single pieces, named "tree." Pieces may be of any color. One child makes 5 vertical rows of 5 large triangles each, 1 row of black, 1 of blue, others of yellow, white, and red. One product slightly resembles a tree. There is a central vertical column of 4 multicolored large triangles, with 3 multicolored squares on each side. It is named "Christmas tree."

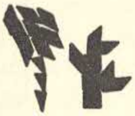
5 years: 1G, 2B

This is the first age when a real resemblance is seen. Two out of 3 are a good shape and a good color. Only one is a multicolored slab. One uses pieces as paint to make a good Christmas tree. There is a black stand, leaves are green, and colored chips represent presents and lights. One simple tree of black and green.



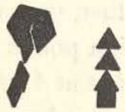
6 years: 3G, 2B

Four out of five trees made are suitably colored with black trunks, green leaves, and good shapes. Pieces may be used loosely as paint, or tree may be stylized, as at 5 years.



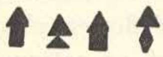
7 years: 4G, 2B

Nearly all have simple black trunks, of squares or diamonds, and green leaves.



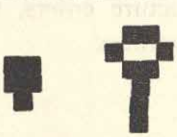
8 years: 5G, 4B

Trees here tend to be very simple 2-piece products, black and green, with any sort of black base (2 scalenes, large triangle, square, diamond) and a large green triangle to represent the leaves.



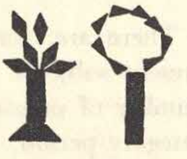
9 years: 6G, 1B

Now all have correct colors, that is, black trunk and green leaves. Products are a little more stylized, and there is strong use of squares.



10 years: 4G, 2B

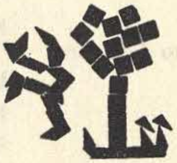
All are black and green except one Christmas tree with colored "presents." Trees tend to have a base around bottom of trunk. Increased use of scalenes. Trunks predominantly of squares.



11 years: 6G, 0B

In keeping with Elevens' tendency to "fly all apart," there is complete variety here in the kind of trees made.

Table 40 (Continued)

12 years: 1G, 0B	
13 years: 3G, 1B There is a marked tendency for abstraction here, a single green diamond standing for a tree, or several grouped standing for several trees. This is seen in both boys and girls. A row of joined green diamonds may stand for a row of trees.	
14 years: 5G, 4B Still abstract. A single green or black scalene or diamond frequently stands for a tree. May be somewhat schematic. Trunk tends to be of black squares or black scalenes. Leaves are a round mass of green (in one case, blue and green) diamonds.	
15 years: 5G, 1B Abstraction continues. A single green square or diamond stands for a tree. May be a windswept, asymmetric mass of green leaves above a black trunk, or a trunk of black squares, surmounted by a circle of green, yellow, and red squares.	
16 years: 7G, 2B Beautifully massed and schematic, pieces used like paint. Solid trunk of black diamonds and mass of green triangles and squares with red and yellow "fruit" (as in Plate 18). Or (as here) diamonds arranged schematically as a forest.	

The high points for people, as Table 23 shows, are from 7 to 12 years and from 14 to 16 years. The kinds of people made are indicated in Table 41 and in Plates 24 and 25.

FACES

Very few faces are made by the present subjects—only 27 in all out of 1500 patterns made. Faces occur most frequently from 12 through 14 years of age, there being 4 faces at 12 years, 5 at 13 years, and 4 at 14 years. There are more, at these ages, in boys than in girls.

In the first 8 years there are only 6 faces, all of them simple. They are made of from 5 to 14 pieces and consist of eyes (some with eyebrows), nose, cheeks, and mouth. All resemble faces, though some contain a few apparently extraneous pieces. Only 1 is surrounded by an outline.

At 9, 10, and 12 years (there are no faces at 11) the typical face is a large circle or square of pieces (the pieces are usually squares or large triangles) surrounding eyes, nose, and mouth.

Table 41

KINDS OF PEOPLE CONSTRUCTED

2 to 4 years:	No children make people at 2 years of age, no girls do so at 3 years, and no boys at 4. Typical at 3 and 4 years, of those few who do make persons, are groups of single pieces, of any shape or color, named; mostly in action, as "men working," "people playing."
5 years:	Single pieces continue to be named "man." *Girls* combine pieces into a group, the total product somewhat resembling a person, with pieces named, according to positions in the structure, as "eyes," "legs," etc. (1 only). *Boys* use pieces as though they were paint, the total massed effect somewhat resembling a person (4 persons made in all).
6 years:	A big advance here, though much variety. Both girls and boys combine pieces to form surprisingly shapely people, made of 8 to 13 pieces each (4 persons in all).
7 years:	As at 6 years, but even more shapely, consisting of from 6 to 9 pieces; or a profile view of a person in action (8 persons here).
8 to 9 years:	As at 7, but people tend to be larger, consisting of from 7 to 21 pieces. A little more emphasis on the body, which may be made up of as many as 6 or more pieces instead of only 2 pieces, as earlier (8 people at 8 years; 11 at 9 years).
10 to 12 years:	At this age human figures made by both sexes are highly complex, very large, and made of many parts. Now appendages, as well as body, are made of several pieces each. A single human figure may contain as many as 38 pieces or even more. At 11 and 12 years, people made by boys are often phallic in shape, rather resembling their rockets (12 people at 10 years; 8 at 11; 9 at 12).
13 years:	In boys (as with trees) a single Mosaic chip is used to represent a person. In girls there is a tendency toward a sharp, angular, though well-formed outline of a person, possibly in action (6 persons at this age).
14 years:	Extremely large, bulky figures which may consist of as many as 30 or even more pieces. Some of these human figures are constructed with extreme symmetry; others are in profile (9 people in all).
15 years:	Once again, as at 13 years, and in both sexes, thin, angular, shapely people, often in action; fewer pieces (14 people in all).
16 years:	Form is excellent here, but size and manner of construction, from one subject to another, are almost completely variable (9 people here).

Faces at 13 and 14 years are again simpler, without the outside frame, and consist, for the most part, of eyes, nose, and mouth. At 15 years only, in this sample, do we find large, complicated, neurotic-looking structures made up of many pieces fitted closely and even solidly. Whether these neurotic-looking faces are typical of the age or merely indicate a neurotic component in the personality make-up of the subject in question we cannot at present say.

At 16 years, only 1 boy makes a face, and this, like earlier faces, consists only of eyes, nose, mouth, and two side pieces.

Whether faces, as made by American children, are a neurotic product, as Lowenfeld has suggested, is not certain. Certainly their infrequency of occurrence suggests that they are not a usual product. Also, some of the 9- to 12-year-old and the 15-year-old products *are* peculiar looking. Only further research will answer the question of their significance.

NAMING OF PERSONS

Girls named 46 of the 53 persons they made, and 34 of the 54 made by boys are named. Table 42 indicates the names given. It will be noted that quite marked sex differences exist, girls using more often the names "girl," "woman," and the vague "people"; boys using more frequently the name "man." Girls name more pairs of people than do boys; boys name more people in action than do girls.

Table 42

NAMING PERSONS

	Girls	*Boys*
Number named	46	34
Boy	8	7
Girl	8	2
Man	15	21
Woman	8	3
Baby	0	1
Person or people	7	0
Pair of people*	13	3
Person or people in action		
Action specified	3	8
Action implied	7	6
Most active ages	4, 7 years	3, 5–10, 15 years
Sports emphasized	—	13–14 years
Greatest variety of subjects	14–16 years	10–12 years

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* This does not include such simple plurals as "people" or "soldiers," but, rather, such terms as "pair of dancers," "girl and boy," etc.

SCENES

Table 43 gives the number of scenes made by girls and by boys, separately, at each age level, and also the mean number of pieces used by each sex at each age. Scenes are illustrated in Plates 26 and 27.

As Table 43 shows, scenes increase in number, in girls, until 7 years, decrease at 8 and 9 years, increase at 10, fall off from 11 through 13, and then increase markedly from 14 through 16 years. In boys we have the same increase to 7 years; there is slightly less of a decrease following 7, but a similar low point occurs at 11 and 12. Boys' scenes increase in number at 13 and 14 years and fall off thereafter.

As far as the number of pieces used is concerned, it will be noted that scenes in both sexes contain more pieces at 6 years than at surrounding ages. In girls the size of the scene increases steadily from 9 through 11 and falls off at 12 and again at 15. In boys the scenes are smaller at 9, 13, and 15 than at surrounding ages.

Table 43

Number of Scenes, and Mean Number of Pieces per Scene

Age in Years	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*11*	*12*	*13*	*14*	*15*	*16*
Total number of scenes														
Girls	0	0	3	9	16	11	10	14	8	7	6	10	12	16
Boys	6	3	5	13	17	14	10	13	6	4	10	11	6	5
Mean number of pieces per scene														
Girls	0.0	0.0	14.0	36.3	30.3	32.0	36.8	40.9	45.8	38.3	42.8	53.7	39.7	45.3
Boys	28.2	24.0	24.0	32.5	28.7	33.2	29.4	49.5	52.2	52.8	44.5	50.7	44.3	37.2

Table 44

QUALITATIVE DESCRIPTION OF SCENES

3 years:	*Boys:*	Naming is considerably ahead of the actual product at this age. Subjects place out single or paired pieces and identify them as "stars," "sun," "day," "sea," "moon," "house," or "bus," "seats," "men working." Large triangles and squares seem to be used more than do other shapes.
4 years:	*Boys:*	Scenes are made up of small clusters of pieces which now begin to resemble the object which they presumably represent, for example, "boat," "street." Squares and large triangles seem to predominate.
5 years:	*Girls:*	This is the first age at which girl subjects attempt to make scenes. Their scenes at this age are few and extremely simple. *Houses* predominate, with some slight accessory, such as a tree, but there is no special spatial arrangement.
	Boys:	*Houses* and *sky* predominate. The chief emphasis is on lining things up, especially at the top and bottom of the paper, as a "walk" around a house, or "tents." Two scenes involve action. Squares are used conspicuously.
6 years:	*Girls:*	Though still fewer than in boys, girls now have three times as many scenes as at 5 years. The typical scene at this age includes *house, grass,* and *sky* and is constructed in horizontal rows of pieces. More than twice as many pieces are used per scene as at 5 years.
	Boys:	More than one-fourth of boys' Mosaics at this age are scenes. The typical scene, rather similar to that in girls, consists of *house, grass,* and *sky* in horizontal rows across the paper. Boys also conspicuously add a *sun* or a *vehicle*. Several include action in their product. More pieces are used per scene, on the average, than at surrounding ages.
7 years:	*Girls:*	There is a sudden sharp increase in the number of scenes made by girls at this age. Only at 16 is the number (16) equaled. Structures resemble those at 6, in that houses are often placed in what we consider to be 7-year-old rows. There are relatively fewer skies, and, in some, houses are grouped in more of a village formation, with different kinds of buildings. Chief subjects are *house or other buildings, tree, flower, grass, sky, person,* or *vehicle*. Use of squares is conspicuous. Scenes are now simpler, more linear, fewer pieces are used, and sky areas tend either to drop out or to become more schematic than at 6. Less of the paper is covered.
	Boys:	More boys make scenes at this age than at any other. Over one-third of boys' Mosaics are scenes. Content is similar to that at 6 years—chiefly *houses* arranged in horizontal rows, with *sky* and *sun*. Fewer pieces are used, on the average, and thus scenes appear to be sketchier than at 6. *Boat* scenes are now prominent. Nine scenes include a *vehicle*. Only one boy includes a person in his scene.
8 years:	*Girls:*	Slightly fewer scenes than at 7 years, though slightly more pieces are used per scene. This and 7 years are the high points for *houses* and *other buildings,* which appear in nearly every scene. *Trees* are still strong, but sky has largely disappeared, and the buildings, even though they may be grouped into a community, are no longer placed "accurately" on the paper but, may be anywhere. *Vehicles* also are conspicuous.
	Boys:	As with girls, *houses* and *other buildings* predominate, appearing in nearly all scenes. Boys' scenes feature the same odd spatial arrangement as girls'.

Table 44 (Continued)

Buildings may be anywhere on the paper. This gives the effect, though a rather inaccurate effect, of perspective, and may be what the child is trying to achieve. (A few, by use of fitted scalenes, make extremely neat and graphic products—usually buildings.)

9 years:

Girls: Fewer scenes (only 10) than at surrounding ages. *Houses,* or *house and tree,* or *trees,* continue to be the main theme. Several are made of carefully and solidly fitted pieces, as were some of the boys' products at 8. One girl pictures outer space, and one has a knight in armor riding up to a castle. Girls use, especially, diamonds and squares.

Boys: Fewer scenes (10) and many fewer pieces used, on the average, than at surrounding ages. There are two main trends observable in boys: (1) *vehicles,* especially rocket ships, solid and phallic looking; (2) blue and white, or blue, white, and black sea scenes with accurate placement of parts but not filled in as solidly as earlier. Houses are dropping out, though *sky* (without houses) and birds remain relatively strong. Diamonds and squares seem to be used more than other shapes. Note small clumps of pieces representing boat, bird, and plane.

10 years:

Girls: This is another strong age for scenes, 14 girls making this type of Mosaic. The most pieces, on the average, are used to date—a mean of 40.9 per child. Houses are virtually absent, and there are only 2 people, but there are 5 *horses* or *other animals.* Of the 14 scenes, 6 here are water scenes or include water, and several girls use the Mosaic pieces, solidly filled in as though they were painting (a preview of 16). Some scenes are stylized, and there is quite a lot of use of squares or large triangles in 4-year-old-type circles.

Boys: More scenes (13) than at surrounding ages. Houses are now virtually out, though there are four other buildings. As with girls, the largest number of pieces to date are used, the mean number per child being 49.5. Of the 13 scenes, 5 are water scenes. *Persons* and *vehicles* are both strong; *action* is strong, and *sports* are coming in. Use of squares is conspicuous. Several concepts not seen in girls—Senate chamber, guided missile, launching station, traffic circle; also pyramids, Egypt, palm trees. Houses are solid and square, with projections at the top. Boys use pieces heavily as though they were paint, as girls do.

11 years:

Girls: Fewer scenes than at 10 (only 8), but larger; mean number of pieces is 45.8, the high point for girls to date. Houses are out, and there are only 2 people, but 3 of the 8 scenes are water scenes. *Flowers* and *trees* are relatively conspicuous, especially palm trees (and pyramids). *Horses* and *other animals* reach their high point here. There is much variety from girl to girl, and products tend to be rather messy. Scalenes are used here quite strongly.

Boys: This is the low point for scenes since 5 years—only 6 scenes, of which 2 are water scenes. As with girls, products are large (a mean of 52.2 pieces per child, the high point), individual, and messy. Some kind of *vehicle,* the leading single item, is made by 3 boys. Squares and scalenes are used outstandingly.

12 years:

Girls: The number of scenes is still declining. Here we have only 7 scenes, which are smaller (mean of 38.3 pieces) than at surrounding ages. *Houses* with *grass* are prominent. Only 2 scenes have animals, 2 have people, 3 have *action.* Squares and scalenes are conspicuous.

Boys: This is the low point for scenes except for 3 years of age. Here only 4 boys make scenes. Scenes made are train, tracks, and grass; witch with '57-model

Table 44 (Continued)

broomstick; motorboat race and water; man on sailboat. There are no houses at this age. Use of different shapes is varied; diamonds, however, are outstanding.

13 years:

Girls: This is the low point since 5 years for scenes. Only 6 girls at this age make scenes. Scenes are slightly larger (mean of 42.8 pieces) than a year earlier. Subject matter is extremely varied, as follows: tree, people, butterfly; dog, food dish, linoleum, sink; modern dance; lake, church, house, grass, tree; two stallions fighting over mare. There is conspicuous use of scalenes and quite a good deal of black.

Boys: Number of scenes is increasing, there being 10 scenes made by boys at this age. More pieces (mean of 44.5) are used than at 12 years. Only 1 house and 1 plan of a house appear here. Conspicuous are *vehicle,* and *sports* or the scenes for sports, as baseball diamond or football game. Space pictures and missiles are prominent. Use of diamonds, placed in a slantwise direction, is conspicuous. In boys, though not in girls, a new tendency toward abstraction is seen, in that a single chip often is used to *represent* a person or object. Thus scenes may be more schematic than realistic.

14 years:

Girls: Scenes are coming in strongly again, 10 girls now making scenes, now the largest size of any age (mean of 53.7 pieces per girl). Scenes seem to be, in most instances, considerably more mature in appearance than earlier. This is the high point for *action* scenes. Rather elaborate abstract scenes are also constructed—Wedding of the Emperor, Firebird Suite. *Trees* are conspicuous. Houses and other buildings are grouped in community fashion. Use of scalenes is conspicuous.

Boys: Scenes are still strong (11) and large (mean of 50.7 pieces). Typical are such masculine *sports* interests as rifle range, soccer field, baseball field. There are also 3 water scenes. Houses (1) and persons (1) are virtually absent. Diamonds and scalenes are used conspicuously.

15 years:

Girls: Another strong age for scenes. There are now 12 scenes, though they are considerably smaller than at surrounding ages (mean of only 39.7 pieces). Here there occur typical adolescent outdoor scenes, many with *people in action, grass, sky.* Also flowers, trees, sun, animals. Typical scenes now picture "woman, mountain, river," "riders, fence, sky, sun," "sailing regatta," or "arbor, fence, flower, grass, sky, clouds." Again we note strong use of scalenes and also of diamonds.

Boys: Scenes have fallen off. There are, in all, only 6 scenes (mean of 44.3 pieces per scene), fewer than at 14. Most characteristic, as at 14, are hockey rink, school, theater. Only 1 scene at this age includes people; only 2 include houses. Use of squares stands out.

16 years:

Girls: More scenes than at any age except 7; now 16 scenes (1 girl in 3 makes a scene, mean of 45.3 pieces per scene). Outdoor natural scenes predominate, with building, *trees,* flowers, *grass,* sun, *sky;* 2 scenes include horses; 7 include *other animals,* but only 2 have people. Typical are "point of land with palm tree, wave, bird," "boat sailing past land," "sailboat pond at Central Park," "amusement park." Pieces may be heavily massed.

Boys: Only 5 scenes (mean of 37.2 pieces), the smallest since 9 years of age. These scenes include "pine tree on shore of lake," "skiing scene," "chemistry experiment," "bridge, water, tree," "street scene." Diamonds are used conspicuously.

Table 44 describes the outstanding or typical kinds of scenes at each age level, italicized items being those which a quantitative analysis of subject matter indicates as leading at each age.

SEX DIFFERENCES

Girls and boys produce, through this total age span, approximately an equal number of scenes—122 in girls, 123 in boys. Scenes, or at least collections of pieces named scenes, appear earlier in boys than in girls—at 3 years in boys but not until 5 years in girls. It is not until 7 years that girls make as many scenes as do boys, but girls' interest in making scenes appears to last longer than does boys'. Girls reach a peak in number of scenes from 6 to 10 years and again from 14 to 16 years; boys reach a peak at 6 to 10 years, and a second slight peak at 13 and 14, but they fall off sharply at 15 and 16, as Table 43 shows.

As to the size of scenes, boys' scenes are the larger at 5, 8, 10, 11, 12, 13, and 15 years; girls' at other ages. Girls' scenes become smaller, in relation to surrounding ages, at 12 and at 15 years; boys' at 9, and 15 years.

Differences in quality or in content are greater than in number or size. Though sex differences in number of houses, other buildings, sky, and sun are virtually nonexistent, we do find very clear sex differences as follows: Girls exceed clearly in trees (34/17), flowers (13/3), horses (11/1), other animals (24/8), and villages or communities (11/1). Girls exceed slightly in grass (25/19), and person (23/19). Boys clearly exceed in water scenes (11/23), vehicles (15/42), sports (4/11), and stadium, baseball field, etc. (2/9).

Thus perhaps the most conspicuous differences lie in the making of many houses, trees, flowers and, at later age, horses, by girls, and in the fact that boys, especially as they grow older, make fewer houses, trees, and flowers and more vehicles, water scenes, and sports scenes.

Boys seem slightly ahead of girls in several respects. They make scenes earlier than do girls, and several content categories, such as sky, sun, vehicle, action, water scene, and palm trees, appear earlier in boys than in girls. Also, the number of scenes increases (after an initial decline at 11 and 12 years) sooner in boys than in girls, and they, more than girls, from 13 years on are able to abstract to the extent of using a single chip to represent (rather than resemble) a person or object.

Part Four

INDIVIDUAL DIFFERENCES

CHAPTER 25

Longitudinal Survey of Individual Subjects

The present study is, by design, a cross-sectional or horizontal survey of Mosaic responses of *groups* of children at succeeding age levels. In some instances an individual child was seen several years in succession, but the treatment of data is cross-sectional.

In this chapter, however, we should like to consider briefly the responses of single subjects as they alter from year to year, since, in the final analysis, cross-sectional age norms appear to be valuable only if they represent what actually happens to the individual subject as he grows older. Earlier studies on the Rorschach test (Ames, 1960) have demonstrated that, to a large extent, the individual child, as he matures, does change in his response to this test in a manner predicted by age norms obtained from cross-sectional study. Such preliminary longitudinal analysis as was possible with the present data suggests that the same holds true of the Mosaic test.

Before reporting this analysis, we should note that, among any group of child subjects, regardless of how well established the age gradient for any given function may be, we find some subjects who bear out predicted age changes in some detail, others whose path is more individual than normative, and still others whose behavior seems relatively shapeless and unpredictable. The fact that an individual subject does not follow a proposed age gradient of behavior changes does not necessarily prove that the gradient is invalid. The behavior of some children is always more characteristic of themselves than of any age, that of others seems invariably shapeless, and that of still others is highly predictable in terms of group means.

Of the present subjects, 62 girls and 61 boys have produced Mosaics at a series of ages ranging from a minimum of 4 successive yearly ages to a maximum of 11. Of these 62 girls for whom longitudinal records were available, 21, or 34 per cent, show rather typical age changes as we have described them in this book; 19 show modulations on some single, characteristic, individual theme rather than typical age changes; and only 22 show neither characteristic predictable age changes nor consistently individual patterns.

Of the 61 boys for whom we have longitudinal series of records, 16, or 26 per cent, show rather typical age changes (judged subjectively, as were the records of the girls); 22 show variations on a consistent, central, individual theme; and only 23 show neither typical age nor consistent individual patterns.

TYPICAL AGE CHANGES

For the 21 girls and 16 boys who show relatively typical age changes from one year to another, we have a mean of six annual Mosaic products available. Plates 28 and 29 give selected sequential patterns made by a typical girl, B. I., and a typical boy, D. C. The patterns of B. I., though typical of the ages which they represent, all focus around changing scenes; the patterns of D. C., though again typical of the ages which they represent, focus around changing central designs.

VARIATIONS IN A BASIC THEME RATHER THAN TYPICAL AGE CHANGES

Somewhat ironically, perhaps, the very thing which the Mosaic test was set up to reveal—unique personality patterns in the individual subject—is scarcely mentioned in the present volume, whose purpose is to delineate patterns which characterize typical performance at each succeeding age level from 2 through 16 years of age.

In the present context, however, we should like to present, verbally, longitudinal summaries of whole series of Mosaic patterns for several of those individuals who, instead of illustrating typical age changes, demonstrate slight age variations on some basic theme or type of response.

As indicated above, of the 62 girls for whom we have longitudinal records, 19 show modulations on some characteristic individual theme; of the 61 boys available, 22 show modulations on some characteristic individual theme. Some of the outstanding examples are described briefly below:

Girl M. B., 5 to 10 years: Frame-and-item design, then scene

5 years: Frame and item, named "design." Multicolored. Frame is three-deep in places, assembled carelessly. Item is a line of diamonds (16 minutes).

6 years: Same, but frame is neater and fitted. Named "design." Multicolored (12 minutes).

7 years: A scene with a partial frame around it. Named "store and two little houses. Design around it. Gate. House. Church." Multicolored (11 minutes).

8 years: Scene, but becoming lighter and more abstract. Frame almost broken up. Named "village—trees, church, house, house for minister." Multicolored (11 minutes).

9 years: A scene, but now a real change—just a large open house and a 9-year-old black and green tree. Named "house and tree."

10 years: A scene which now has people in it. Large tree—"a honey-bear tree," boy and girl.

Girl M. E. C., 10 to 16 years: An entire series of separate designs

10 years: Four rather close designs.

11 years: Five separate designs, more scattered.

12 years: Four separate designs but more solid.

13 years: Only three designs.

14 years: (Refused to come in and take the test.)

15 years: Five separate designs.

16 years: Six separate designs, rather more unusual than earlier.

Girl A. G., 8 to 14 years: Changes in nonrepresentational patterned designs

8 years: Moderately symmetric, all-color, oblong design reaching top of board (21 minutes).

9 years: Rim design (frame), empty center, all colors. Effort at symmetry (23 minutes).

10 years: Frame on two sides and item. Frame is more solid than at 9 years. Patterned center, all colors (1 hour +).

11 years: Central design, again large and relatively symmetric, all colors, no frame. "Flower or jack on floor of castle."

12 years: Central design has widened out and become square. All colors. "Church window."

13 years: Central design has narrowed down and is only about half as wide as at 12 years. All colors (10 minutes).

14 years: Design once again more square. Not quite symmetric enough to be typical of 14 years. All colors (25 minutes).

Girl C. A. G., 10 to 16 years: A rather neurotic-looking product, to some extent reflecting current interests

10 years: Small multicolored slab (3 minutes).

11 years: Slab, more whirling, black omitted (8 minutes).

12 years: Top-heavy "woman" with black hair (7 minutes).

13 years: Odd-shaped "person" (16 minutes).

14 years: Black, white, and yellow "nun" (5 minutes). (Subject temporarily attending a Catholic school.)

15 years: All little pieces, odd-looking face. Neurotic use of small pieces massed (10 minutes).

16 years: Tricky fit, "girl" and just the leg of a "man" (14 minutes).

Boy J. C., 11 to 15 years: A series of almost identical airplanes; a masculine but stereotyped and almost unchanging product of a boy of limited intelligence

Boy B. C., 11 to 16 years: Marked, unpredictable changes from age to age, small design or object

11 years: A whirling central design based on a 4-year-old circle. All colors. Named "saw" (3 minutes).

12 years: A red, white, black, and green flower (2 minutes).

13 years: Blue and black typical 13-year-old circle of triangles, white center.

14 years: Basic 4-year-old circle, all colors (1 minute).

15 years: Small blue car (12 minutes).

16 years: A number "5," and a letter "G."

Boy R. S., 5 to 10 years: Object giving way to scene, no designs

5 years: Christmas tree, good form and good colors (7 minutes).
6 years: Five-piece red and blue arrow (2 minutes).
7 years: Scene: house, serial path, sun of red, blue, and black.
8 years: Object, less serial, more solid. All colors. Named "Blue Sunoco gas station."
9 years: Scene—"rocket ship with fire, gas tank, signal when to go." Black, red, white, yellow, and green. Horizontal alignment.
10 years: "Guided-missile launching station." Very 10-year-oldish design, V lines of squares topped with triangles. Red omitted.

Boy W. C., 10 to 16 years: Age changes in a basic red, white, and blue theme

10 years: Open red, white, and blue pattern covering whole board and named, "design for doilie." Pieces around edge, and central rocketlike designs.
11 years: Scene of 8-year-oldish red, white, and blue houses.
12 years: Neat red, white, and blue central design with white center.
13 years: Red, white, blue, black, green, and yellow diamond.
14 years: Neat square, red, white, and blue design.
15 years: Unsuccessful central red, white, and blue design.
16 years: Large, successful, neatly balanced central design of red, white, and blue.

Boy R. W., 10 to 16 years: At every age but 13, many separate small scattered designs; thus at 10 years, 10 separate designs; at 11 years, 13; at 12 years, 6; at 13 years, 2; at 14 years, 7; at 15 years, 12; at 16 years, 9.

In addition, products of the following subjects, which express individual age variations on some basic theme, are described here briefly and are illustrated in Plates 30 to 32.

Boy D. J., 10 to 16 years:
Highly intelligent boy, showing modifications on a single theme.
Central design changes with age (Plate 30).
Boy D. G., 6 to 11 years:
Age variations in scenes in a highly superior, well-rounded boy (Plate 31).
Girl A. P., 14 to 16 years:
Gradual improvement in the allover pattern of a superior but somewhat neurotic girl (Plate 32).

We have also included in Plate 32 three examples of apparently rather gifted productions. Such examples occur at all ages in our collections. Those reproduced in Plate 32 include deer, product of a 12-year-old girl; crab, product of a 13-year-old girl; and peacock, product of a 14-year-old girl.

OTHER KINDS OF LONGITUDINAL DEVELOPMENT

In the sections immediately preceding, we have discussed the two outstanding kinds of age change observed in individual subjects of the present study:

1. First, there are those subjects whose products change from age to age in a manner predicted by the age-level descriptions which we have presented. Of 62 girls and 61 boys for whom we have available longitudinal records, 21 girls and 16 boys follow the predicted age patterning rather closely.

2. Others—19 girls and 22 boys—rather than expressing more or less typical age changes, express instead slight age variations on some individual theme unique to themselves.

This leaves 22 girls and 23 boys who make some other type of response. What other kinds of age change have we observed?

3. A small number of the present subjects seem to get stuck in a single way of responding and apparently find it hard to shift their response with increasing age. Thus one boy made a series of almost identical airplanes from year to year; another a series of almost identical large squares made of squares. Others made only very slightly changing slabs.

4. A fourth group of subjects may be characterized as having, as far as we can discern, no pattern of age change: The patterns do not change in a predictable way, do not constitute a series of slight changes on some characteristic individual theme, and do not remain the same from year to year; instead, the response at any given age seems quite unrelated to what precedes and what follows, the behavior appearing to be hit or miss.

Both those subjects who, from one year to another, illustrate typical age changes and those who illustrate variations on a single individual theme have in common the fact that products, for the most part, become, with age, both better organized and increasingly successful.

AGE PERIOD SHOWING THE MOST CLEARLY CHARACTERISTIC AGE CHANGES

To check on the general age period at which subjects show most clearly what we consider to be typical age changes, we have compared the number of girls and of boys in the 5- to 10-year age range who show typical age changes with the number who show such typical changes in the age range from 10 to 16 years.

There are available 15 girl subjects with yearly records from 5 to 10 years, and 38 from 10 to 16 years. There are 20 boy subjects with available yearly records from 5 to 10 years, and 35 from 10 to 16. (These figures are slightly smaller than those given just earlier, as, in those, some cases were included for whom only four sequential Mosaics were available.)

For girls, 7 of the 15 5- to 10-year-old records (that is 46.55 per cent) showed typically patterned changes. Of the 38 10- to 16-year-old records available, 11, or 28.94 per cent, showed typically patterned changes. For boys, 6 of the 20 5- to 10-year-old records (30 per cent) and 8 of the 35 10- to 16-year-old records (22.85 per cent) showed typically patterned changes. Combining boys and girls, 13 out of 35 (37 per cent) in the earlier age period and 19 out of 73 (26 per cent) at the older period were typically patterned. Thus it appears that patterning in the earlier-age-range Mosaic products tends to accord with suggested norms better than does patterning in the later age range; that is, products are more predictable and less individual at the earlier ages. For both age ranges, girls more frequently than boys follow a typical and expected pattern of age changes.

CHAPTER 26

Sex Differences

Sex differences in Mosaic response are so marked for nearly every variable that all analyses have been made for girls and boys separately. All tables and the text of each chapter reveal these sex differences plainly. Outstanding differences in the performance of the two sexes may be summarized as follows.

BY ATTRIBUTES

TYPE OF DESIGN

The most outstanding and clear-cut sex difference appears in type of design. At every age except 15 and 16 years, when the performance of the two sexes is very similar, more boys than girls make representational patterns (that is, objects and scenes combined). Conversely, at every age from 3 through 14 years, more girls than boys make nonrepresentational (or abstract) designs with pattern. Thus we note, somewhat surprisingly, that girls show more interest in the abstract, boys more interest in the concrete.

At 15 years, however, the situation reverses itself. Now girls make very slightly more representational than nonrepresentational designs with pattern; boys make slightly more nonrepresentational than representational patterns. At 16 years this reversal of trend continues. Girls make 26 representational as against 18 nonrepresentational designs with pattern; boys make 22 representational as against 28 nonrepresentational designs.

Patterned designs do not commonly occur at 2 years of age. At 3, more boys than girls make designs with some slight pattern. From then on, except at 13 years when more boys than girls make patterned designs, sex differences as to patterned versus unpatterned designs are slight.

FORM

Form has been classed in six levels, ranging from I to VI as to level of accuracy, VI being the most accurate. Classification of all products of the two sexes separately shows that the largest single number of girls' products fall at level V as early as 6 years of age, equally at levels V and VI at 7 years, and at level VI from 8 years on. The largest single number of boys' products reach level V at 6, 7, 8, and 9 years. Not until 10 years and following do the largest single number reach level VI. Thus individual girls reach form level VI sooner than do individual boys.

If we divide subjects, as to form, into two groups—those whose products rate at levels I, II, and III, and those whose products rate at levels IV, V, and VI—the picture is slightly different. Then we find that, even as early as 4 years, half as many boys are in the more mature group as in the less mature, and, from 5 years on, more boys fall in the more mature than in the less mature group. Girls' products, as a group, are a little less advanced. Not until 5 years do half as many girls' products fall in the more mature as in the less mature group, although at 6 years and following the majority fall at level VI. Thus, as a group, boys seem to attain accuracy of form a little earlier than do girls.

SHAPES OF PIECES

Sex differences as to the shapes of the pieces used most are quite conspicuous. The chief difference is that, though large triangles are used most by both sexes from 2 through 4 years of age and squares from 5 through 8 years, after that, in general, boys tend to favor the use of squares and diamonds, and girls favor diamonds and scalenes. The trends in girls are a little more clear cut. Increasingly from 7 years on the sex differences are marked. Squares predominate earlier in boys than in girls, as do diamonds. Scalenes predominate at no age in boys.

COLOR

As to color, the trends for the two sexes are quite similar, with small differences. Blue leads in boys at every age except 2 years, when black predominates. It leads in girls at every age except 9, when black leads; at 13, when red and black lead; at 14, when white leads; and at 16, when black ties with white.

Colors other than blue are used more or less to the same extent by the two sexes, except for green, which is used more by girls than by boys. Thus in boys the predominance of blue is much more marked; in girls the use of color is considerably more varied.

When we consider the use of a single color only, or of only two or three colors in a design, we find that there is more variation and less concentration of color in girls than in boys.

As to the way in which color is used in representational designs, boys reach level II—partial use of color—as early as 4 years of age; girls not until 5 years. A conspicuous number of girls, however, reach level V—color pattern adds significance to form—by 9 years of age, but boys do not attain this level until 10 and do not give a major portion of their responses at this level until 14 years.

Boys at the older ages are more likely to respond at level IV—full color pattern repeating form—than at level V. Also, boys at 12, 13, and 15 years drop back to level II, but girls do not. Thus, in general, girls seem to use color a little more maturely than do boys in making representational objects.

As to nonrepresentational patterns, in both sexes the majority of children show no evident use of color from 2 through 4 years. At 5 years, boys' use of color is slightly more mature than that of girls. At 6 years, both predominantly exhibit partial use of color consistent with form. At 7 and 8 years, girls use color more maturely than do boys, girls exhibiting chiefly a full color pattern consistent with form, boys only a partial color pattern or no color pattern. At 9 years, both regress in the use of color. At 10 years and from then on, the majority of girls and a substantial number of boys use a full color pattern consistent with form. Thus there is a tendency here for girls to be a little more advanced than boys in the use of color.

CONTENT

Sex differences in content (things named) for most categories are limited. Girls and boys make and name approximately an equal number of buildings other than house, faces, scenes, sky, abstract, water, and pyramid. Boys make more persons than do girls from 3 through 10 years, but girls make more than boys from 11 to 16 years. Boys make more houses than girls except at 3, 4, 8, 11, 12, and 14 years, when the differences are small.

Such sex differences in content as do exist, however, are quite striking. From the major content categories observed, we selected what we considered to be the outstandingly masculine symbols—boat, car or train, and airplane, rocket, arrow or kite—and also what we considered to be the outstandingly feminine symbols—grass, tree, and flower.

Table 45 shows that, for all ages combined and also for all the individual ages, boys clearly surpass girls in the use of the presumably masculine symbols, and girls surpass boys in the supposedly feminine symbols, except at 4 and 5 years. Thus, whereas girls, in all, give 33 flower responses, only 6 boys make flowers; whereas 58 boys make figures in the airplane-rocket category, only 15 girls make such figures; and there are 35 cars and trains made by boys, as against 4 made by girls. For all masculine symbols combined, boys have a total score of 137 as against 42 for girls. For all feminine symbols combined, girls have a total score of 117 figures as against 47 made by boys.

Shape. From a slightly different approach which considers the shape and not merely the names of the figures, we have counted the number of diamond-shaped figures and also the number of phallic-shaped figures, whether named "rocket," "missile," "arrow," etc., or merely shaped in this way. Table 46 indicates age and sex differences. For the most part, sex differences as to the number of diamond-shaped figures are variable. Except at 5, 7, 15, and 16 years, more boys than girls make phallic-shaped objects.

Table 45

MASCULINE AND FEMININE CONTENT, BY NAME*

Age in Years	*3*		*4*		*5*		*6*		*7*		*8*		*9*		*10*		*11*		*12*		*13*		*14*		*15*		*16*		*Total*	
	G	*B*	*G*	*B*	*G*	*B*	*G*	*B*	*G*	*B*	*G*	*B*	*G*	*B*	*G*	*B*	*G*	*B*	*G*	*B*	*G*	*B*	*G*	*B*	*G*	*B*	*G*	*B*	*G*	*B*
Masculine:																														
Airplane, rocket, arrow, kite	1	1	1	1	1	8	4	8	3	4	2	7	2	5	0	8	0	4	0	4	0	3	0	2	1	1	0	2	15	58
Car, train	2	4	1	1	0	2	0	0	0	0	0	1	0	1	0	2	0	4	0	5	1	5	0	2	0	5	0	3	4	35
Boat	1	1	1	5	0	1	1	1	2	6	2	1	1	6	4	5	2	5	1	3	0	3	1	3	3	1	4	3	23	44
ALL	4	**6**	3	**7**	1	**11**	5	**9**	5	**10**	4	**9**	3	**12**	4	**15**	2	**13**	1	**12**	1	**11**	1	**7**	4	**7**	4	**8**	42	137
Feminine:																														
Grass	1	0	0	0	1	1	5	5	4	2	1	2	2	1	2	1	2	1	2	1	1	0	0	0	3	0	7	0	31	14
Tree	3	2	1	2	1	2	3	2	4	2	5	4	5	1	4	2	6	0	1	0	3	1	5	4	5	1	7	2	53	27
Flower	0	0	0	1	1	1	2	0	2	0	3	0	2	1	2	0	6	1	3	1	4	0	3	1	3	0	2	0	33	6
ALL	**4**	2	1	**3**	3	**4**	**10**	7	**10**	4	**9**	6	**9**	3	**8**	3	**14**	2	**6**	2	**8**	2	**8**	5	**11**	1	**16**	2	117	47

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* These figures are, in a few instances, smaller than those given in Table 23. We have here omitted 2 years, since at that age many products which in *no* way resemble car, grass, tree, etc., are so named.

Table 46

DIAMOND-SHAPED AND PHALLIC ROCKET-SHAPED FIGURES

Age in Years	*5*		*6*		*7*		*8*		*9*		*10*		*11*		*12*		*13*		*14*		*15*		*16*		*All*	
	G	*B*	*G*	*B*	*G*	*B*	*G*	*B*	*G*	*B*	*G*	*B*	*G*	*B*	*G*	*B*	*G*	*B*	*G*	*B*	*G*	*B*	*G*	*B*	*G*	*B*
Diamond shape*	—	—	—	—	—	—	—	1	1	2	1	1	3	1	1	3	2	1	1	1	—	2	1	1	10	13
Rocket, missile, gun, arrow, etc.†	1	1	—	3	2	—	—	3	—	5	—	7	1	6	—	4	1	4	—	1	1	2	—	2	6	38
Other object with phallic shape	—	—	2	1	2	1	1	3	1	2	—	2	1	3	6	3	2	2	4	6	6	4	4	2	29	29
All phallic shapes	1	1	2	4	4	1	1	6	1	7	—	9	2	9	6	7	3	6	4	7	7	6	4	4	35	67

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* A fundamental diamond made of 4 diamonds is not counted here. Here the minimum requirement is a diamond-shaped figure made up of no less than 9 diamonds. This requirement was adhered to strictly. Thus a diamond made of 8 pieces, with only 1 piece missing, was not counted.

† Figures here are lower than in Table 45 which indicates the number of rockets, etc., *named*. Here, mere naming is not the requirement; rather, it is the making of a phallic-shaped object named rocket, missile, etc.

COMPACTNESS

For both representational and nonrepresentational designs, boys' designs tend to be more compact than those of girls. Also boys' designs become predominantly compact sooner than do those of girls. There is a tendency toward increasing compactness of design with increasing age. For girls, all types of designs considered together, there is a slight decrease in compactness at 7, 11, 15, and 16 years; for boys, there is a slight decrease at 7 years.

SYMMETRY

Sex differences in symmetry of figures are slight. Boys' figures are more symmetric than girls' at 10 and 11 years and at 13 to 16 years. Symmetry drops suddenly in girls at 10 to 11 years and again at 15 and 16 years. In boys, it drops sharply only at 11 years.

For the total age range, almost identical numbers of girls and boys make symmetric patterns, but there is a slight tendency throughout for boys' products to become increasingly symmetric, whereas symmetry falls off slightly in girls at 15 and 16 years.

TIMING

Sex differences are inconspicuous and inconsistent in regard to timing. Averaging the means for all ages from 3 through 16 years gives an average time for all girls at all ages of 8.6 minutes per product; for all boys at all ages, an average time of 8.5 minutes. There are somewhat less sharp changes from age to age in girls than in boys. There is a very sharp drop in the median time for boys at 16 years, but this is not found in girls.

EXTENT TO WHICH PATTERNS OF INDIVIDUAL SUBJECTS CHANGE IN ACCORDANCE WITH AGE NORMS

For 62 girls and 61 boys among the present subjects, longitudinal records at four or more successive yearly age levels are available. Of these subjects, 34 per cent of the girls and 26 per cent of the boys exhibit rather typical age changes; that is, they follow out the pattern of age changes predicted by our age-level characterizations.

If we narrow down the subjects considered to those with products made at every age from 5 to 10, or from 10 to 16, we find that 46.58 per cent of the younger girls and 28.94 per cent of the younger boys progress in a predictably patterned fashion. Of older subjects, 30 per cent of the girls and 22.85 per cent of the boys change in a predictable manner.

This analysis indicates that girls, more than boys, follow a typical and expected pattern of age changes.

BY AGE

An analysis of sex differences for each successive age level is given in detail in each age chapter (Chapters 9 through 23). The reader is referred to these chapters for further details.

TWO YEARS

Differences are slight. Both girls and boys chiefly pick up single pieces and scatter them on the board, neither sex seeming to be ready to respond effectively to the test. Boys spend a longer time, on the average, on their responses and are slightly more advanced as to type of design.

THREE YEARS

Again, sex differences are very slight, both sexes making chiefly nonrepresentational designs without pattern. Form is a little better for girls than for boys. We see here the beginning of an outstanding sex difference which prevails through 14 years of age: girls make more nonrepresentational designs with pattern; boys make more representational designs.

FOUR YEARS

The sex differences are still very slight. Girls make a few more nonrepresentational designs with pattern than do boys, boys a few more representational designs than girls. Both quality of form and amount of naming are a little more advanced in girls, and girls' products are a little more compact.

FIVE YEARS

As usual, girls make more nonrepresentational designs with pattern than do boys, and boys make more representational objects and scenes than do girls. Form level is slightly higher in girls, and the products of girls are slightly more symmetric. The products of boys are more compact but include more pieces. Boys tend to overlap, pile, and stand pieces on end more than do girls.

SIX YEARS

The most conspicuous difference here is that girls make more central designs than do boys, and boys make more representational objects, especially scenes, than do girls. Both sexes, however, make more representational designs, especially more objects, than any other type of product.

Girls use more pieces than do boys, take a longer time to build, and make more symmetric products. The products of boys are more compact.

Sex differences are especially small at this age, but here, for the first time, not only do boys make more vehicles and more phallic-shaped designs than do girls, but girls make more trees and flowers than do boys.

SEVEN YEARS

The products of the two sexes are less alike at this age than at 6 years. Although representational patterns still lead in both sexes, the differences (in favor of girls for nonrepresentational designs with pattern and in favor of boys for representational objects) are more conspicuous. The number of scenes is about equal. The scenes in both sexes resemble those made at 6 years, except that there is less emphasis on sky area than earlier.

The linear or serial placement of single pieces or of small objects in horizontal rows, so highly characteristic of Sevens, is seen in both sexes but more in boys. This is the second age at which boys clearly make more vehicles than do girls, and girls make more grass, trees, and flowers than do boys.

Form is a little better in girls' products, and placement is a little more symmetric in girls.

EIGHT YEARS

As at 7 years, representational designs lead in both sexes, but girls are clearly ahead in nonrepresentational designs with pattern, boys in representational designs. Both sexes feature multiple objects placed oddly on the page (perspective?). Small 2-piece houses, especially in rows, occur more in girls than in boys. In both sexes, the patterns are more solid and more massed than at 7 years.

Boys use more pieces than do girls, take longer in building, and build more compactly but less symmetrically.

As also at 6 and 7 years, boys make more rockets, planes, and other vehicles and more phallic-shaped designs; girls make more trees and flowers.

NINE YEARS

Boys, as usual, make more representational patterns than anything else, and exceed girls in their number. Girls make an equal number of nonrepresentational designs with pattern and representational designs, but they exceed boys in the former. The patterns made by boys tend to be very small and are conspicuously of black or blue. This outstanding aspect of Nines is seen more in boys than in girls. The patterns of girls tend to be either very large *or* very small, though, as with boys, black or blue figures are conspicuous.

Form tends to be better in girls than in boys. Girls use more pieces, take longer in building, and build a little more symmetrically. Girls use squares most, diamonds next; boys do just the opposite. Boys, as usual, make more vehicles and more phallic-shaped objects; girls make more grass, trees, and flowers.

TEN YEARS

The leading product for both sexes is representational design, but boys exceed in these, as usual, and girls exceed in nonrepresentational patterned designs. The central trends and characteristics of the age show up most clearly in boys. Thus boys use squares the most of any shape (girls use scalenes most), and the products of boys tend to be square—large designs made only of squares, or large square houses. Even their rockets are made of squares, with side projections; and many of their men resemble rockets.

Girls do make such products, but this occurs less often than in boys. Boys make many more vehicles than do girls, and many more phallic shapes; girls make more grass, trees, and flowers. The form level is more advanced in girls, and their products are more symmetric and less compact.

ELEVEN YEARS

As frequently, the largest single class for both is representational design, but this occurs more in boys than in girls; nonrepresentational patterned designs occur more in girls than in boys. Girls, much more than boys, demonstrate the "flying apart into many small pieces" patterns so characteristic of this age. The key to the performance of boys is, on the other hand, the nature of the objects made—the majority being central phallic-looking objects. Even their men resemble rockets in shape. Thus girls seem to be bursting apart, but boys are pulling in to make sharp-pointed figures of clearly phallic design. Four times as many boys as girls make phallic-shaped objects, and nearly seven times as many make some kind of vehicle. Girls make seven times as many objects in the tree-grass-flower category as do boys.

Form is a little better in boys than in girls, and boys' products are more compact and take longer to build. Girls are more advanced in the use of color.

TWELVE YEARS

Now girls not only make more nonrepresentational designs with pattern than do boys, but they make more of this type of design than any other. Boys make many more representational designs than girls do, and they make more representational designs than any other kind. There is great variety, from child to child, in both sexes. The use of color is slightly more advanced in boys than in girls. The products of girls are more symmetric, larger, and take longer to build.

Boys make more vehicles but only 1 more phallic-shaped design than do girls. Girls make more grass, trees, and flowers than do boys.

THIRTEEN YEARS

Girls make chiefly nonrepresentational designs with or without pattern, and they make many more of both than do boys. Boys make chiefly representational objects and scenes, and they make more of both than do girls.

Girls make more of the spiky black and yellow designs characteristic of this age; boys make more of the rounded closed circles with empty centers, also characteristic of the age. In both sexes, the patterns seem to be pulling in toward the center. Boys' products tend to be more effectively patterned than those of girls, girls making more slabs than boys. Girls use more pieces, but boys take longer to build.

Boys make 11 vehicles as compared to 1 for girls, but girls make 8 nature products whereas boys make only 2. Boys make twice as many phallic-shaped objects as do girls.

FOURTEEN YEARS

Sex differences are minimal here—perhaps the least of any age. The type of design starts to shift from what was observed earlier. Thus girls now make 24 nonrepresentational designs with pattern, and boys make 23. Girls make 23 patterned designs, boys 26. The performance of the two sexes is obviously becoming more alike. Symmetry of the products (as to both shape and color) is the most characteristic factor for both sexes, though this is a little more conspicuous in boys.

Girls are slightly more advanced in the use of color than are boys. Vehicles and phallic-shaped designs still predominate in boys, and various aspects of nature in girls, but the differences are relatively small at this age.

FIFTEEN YEARS

Here, after a start in this direction at 14 years, the lines have crossed, and now girls make more representational patterns than nonrepresentational patterned designs, and they make more of these than do boys. Boys now make outstandingly nonrepresentational designs with pattern, and they make more of these than do girls.

The outstanding characteristics of Fifteens (asymmetry, one-sided and off-center qualities, neurotic-looking patterns, the use of dark colors, whirling designs, and the strong use of scalenes) show up a little more strongly in girls than in boys. The products of boys are more variable than are those of girls. Boys continue the symmetric products of age 14 to a much larger extent than do girls.

Boys, as usual, make more vehicles than do girls; girls make more grass, trees, and flowers. Girls, for the first time since 7 years, make more phallic-shaped objects than do boys.

Form is better in girls, and their use of color is ahead of that in boys. Boys' products are more compactly built and more symmetric than those of girls, but girls' products contain more pieces.

SIXTEEN YEARS

The change-over in products which began slightly at 14 and which showed itself clearly at 15 continues here. Boys now, as at 15, make more nonrepresentational designs with pattern than do girls; girls make more representational designs than do boys. Boys still make more objects than do girls, but the preponderance of scenes in girls causes girls to lead for the whole representational category.

Symmetric central designs, many of them starting to open out and to be more spaced, are perhaps the most characteristic pattern at this age, and boys express this characteristic a little more fully and frequently than do girls.

The often heavily massed color scenes (often depicting nature) occur most in girls. Girls use more pieces than do boys. Boys' products are more compact and more symmetric than girls'.

SUMMARY

In summary, we have a picture of the Mosaic patterns of girls as compared to those of boys as being predominantly nonrepresentational, a little quicker to attain good form individually (though as a group slightly less advanced), made outstandingly of diamonds and scalenes, more varied as to use of color, more advanced as to accuracy of use of color, and less compact than those of boys. Girls also make more of such products as grass, trees, flowers—all hypothesized as being more feminine than masculine symbols.

Boys tend to make more representational designs than do girls, and their individual products attain good form a little later than do those of girls, though seeming to be of slightly better form as a group. Boys' products are made up outstandingly of diamonds and squares, are less variable as to use of color (blue is outstanding at all ages except 2 years), less advanced than girls' as to accuracy of color use, and more compact. As to content, boys make more boats, more cars and trains, more rockets, planes, arrows, and kites—all hypothesized as being more masculine than feminine symbols. Boys also make more houses at most ages. Girls, for the most part, make more diamond-shaped products than do boys; boys, at most ages, make more phallic-shaped objects than do girls.

It is of interest to note that the outstanding sex difference—that girls make more nonrepresentational patterns and boys make more representational—is reversed at 15 and 16 years when girls make more representational than nonrepresentational, and boys make more nonrepresentational than representational.

What seem to the writers to be the most highly characteristic patterns of each individual age are seen sometimes more clearly in girls, sometimes in boys. The performance of girls seems most highly characteristic of the age at 8, 11, 15, and 16 years; that of boys seems most highly characteristic of the age at 7, 9, and 10 years. At 14, both show the age clearly, in a similar manner. At 13, boys and girls demonstrate different, though characteristic, aspects of the age.

Part Five

DISCUSSION AND SUMMARY

CHAPTER 27

Discussion

In discussing and describing the Mosaic product, the investigator who wishes to present his findings and conclusions to others must avoid two opposite hazards. One of the most common errors made by earlier investigators in this field is an overelaborate, objective classification of Mosaic products with respect to their formal properties. There is grave danger in overclassification with respect to such properties as form level, degree of compactness, level of color use, etc., to the extent that one loses sight of *what the child actually makes.*

The opposite danger lies in a qualitative description of the individual product which is so elaborate and subjective that, whereas it gives a clear and comprehensive picture of what has been made, there is a risk of losing sight of its place in the total scheme of possible productions. In leaving out all objective classification, we lose sight of the location of a product on any evaluative scale.

We have tried, in this book, to avoid either extreme, and have attempted a type of classification and description which reveals the individual product but, at the same time, indicates where it fits in a larger perspective—in this instance, an age scale.

The next step might be a study which would give more emphasis to process rather than, as here, to product. Following this, a useful study might present individual Mosaic products and indicate, presumably by means of comparing them with other data, the way in which they reveal individuality.

SCORING AND EVALUATION

It seems reasonable to suppose that, in the future, when knowledge permits, the scoring and evaluation of the Lowenfeld Mosaic response may be no less clear cut and revealing than that of the Rorschach. Those who use the Rorschach test effectively with children know very well that the objective scoring of this test is but a small start toward its complete and proper evaluation. Yet it is with objective scoring that nearly everybody starts.

Having scored the Rorschach response, and after making a content analysis, many users proceed along three lines:

1. Based chiefly on scoring and content, but also including subjective factors, the examiner determines the developmental level of the performance.

2. Using the scoring, and consulting any known list of "signs" and other descriptive data available, as well as using subjective judgment, the examiner arrives at a diagnostic evaluation, assuming that there is any question of abnormality.

3. Using scoring, content analysis, and any other objective information available, but depending perhaps primarily on subjective and qualitative factors, the examiner constructs a psychogram which "puts together" the individuality of the subject. In fact, it might almost be said that the picture of the subject's individuality evolves, in the examiner's mind at least, as he goes over and over the *total response*. The psychogram includes, but certainly goes far beyond, mere objective scoring factors. No mere set of scores or list of signs can give the skilled Rorschach examiner the answer he is seeking.

In our opinion, there is some tendency on the part of Mosaic specialists not only to start with step 3 but to ignore and even to disparage the value of steps 1 and 2.

The Mosaic response, unquestionably, reveals an aspect of individuality quite different from that obtained in the Rorschach, but we have no evidence that its evaluation need be entirely different. Certainly there are some areas—in the area of content, for instance—in which the Mosaic gives us less evidence than does the Rorschach. Movement, too, permits a less elaborate differential evaluation in the Mosaic than in the Rorschach. It may be that color is about equally revealing in the two tests. Certainly form factors reveal themselves much more fully and elaborately and in much greater detail in the Mosaic than in the Rorschach.

Wideman's papers on objective scoring (Wideman, 1953, 1955), summarized on page 37, constitute the greatest contribution we know of toward an objective scoring method for the Mosaic. We have, at this time, little to add, but might suggest the following possibilities in line with Rorschach scoring:

Though movement in Mosaic design is rare enough to warrant only a minor scoring sign, it would seem that color might conceivably be scored somewhat as in the Rorschach as FC, CF, and C. Absence of any special or significant use of color could be scored F (form), and F could certainly be rated as F+, F± and F—. Slabs might have some special score as shading does in the Rorschach, and +, ±, and — might be combined with this symbol. Content (for objects and for scenes) would be easy and meaningful to score.

A major scoring differentiation could be made for the several categories listed in Table 13, as for unpatterned and patterned nonrepresentational designs and representational patterns.

Aesthetic pleasingness should certainly be a major scoring consideration. We should also like to consider as a formal scoring consideration Walker's (1957) dichotomies of stable and unstable, surgent and desurgent, aggressive and nonaggressive, and creative and noncreative.

Once a formal scoring system has been set up—and we anticipate that one day it will be—then the next step will be the determination of age norms, as has been done in at least a preliminary way for the Rorschach.

Before a formal scoring system for children's Mosaics can be evolved, it will be necessary to proceed further along the line of an accurate description of patterns which characterize the several age levels. This implies not only a qualitative description but a quantitative treatment as well. A mere counting of pieces, or a counting of the number of pieces of any single color, will certainly not, of itself, provide the key to changes which characterize the Mosaic pattern as it shifts from age to age, but, if we assume that behavior in the Mosaic, as in response to other tests, to some extent follows an orderly development with age, then we must anticipate that a quantitative analysis will throw some light on the age changes which may be expected to take place.

ADJACENT AGE COMPARISON OF OUTSTANDING MOSAIC PATTERNS

Though we have not as yet determined definitive age norms for child Mosaic responses, we have throughout this presentation identified certain types of Mosaic patterns as outstandingly characteristic of certain age levels. For instance, we

Table 47

Adjacent Age Comparison of Outstanding Mosaic Patterns: Number of Subjects Showing Each Pattern

SERIAL PLACEMENT OF SEVEN

5 Years			*6 Years*			*7 Years*			*8 Years*			*9 Years*		
G	*B*	*All*	*G*	*B*	*All*	*G*	*B*	*All*	*G*	*B*	*All*	*G*	*B*	*All*
8	6	14	9	7	16	**20**	**26**	**46**	8	4	12	3	6	9

SQUARE PRODUCT MADE OF SOLID SQUARES

8 Years			*9 Years*			*10 Years*			*11 Years*			*12 Years*		
G	*B*	*All*	*G*	*B*	*All*	*G*	*B*	*All*	*G*	*B*	*All*	*G*	*B*	*All*
6	6	12	7	6	13	6	**16**	**22**	2	7	9	4	8	12

BREAKUP INTO MANY SMALL OBJECTS OR DESIGNS

	9 Years			*10 Years*			*11 Years*			*12 Years*			*13 Years*		
	G	*B*	*All*	*G*	*B*	*All*	*G*	*B*	*All*	*G*	*B*	*All*	*G*	*B*	*All*
Designs	2	0	2	3	1	4	6	2	8	3	1	4	2	0	2
Objects	3	3	6	1	3	4	6	2	8	2	1	3	1	3	4
	5	3	8	4	4	8	**12**	**4**	**16**	5	2	7	3	3	6

SMALL HOLLOW CIRCLES OR SHARP, SMALL, ASYMMETRIC DESIGNS

11 Years			*12 Years*			*13 Years*			*14 Years*			*15 Years*		
G	*B*	*All*	*G*	*B*	*All*	*G*	*B*	*All*	*G*	*B*	*All*	*G*	*B*	*All*
5	4	9	6	5	11	**14**	**11**	**25**	6	4	10	5	5	10

SYMMETRIC DESIGNS

11 Years			*12 Years*			*13 Years*			*14 Years*			*15 Years*			*16 Years*		
G	*B*	*All*	*G*	*B*	*All*	*G*	*B*	*All*	*G*	*B*	*All*	*G*	*B*	*All*	*G*	*B*	*All*
4	2	6	9	7	16	10	8	18	**16**	**14**	**30**	8	10	18	7	9	16

think of simple serial placement of pieces or patterns as characteristic of the 7-year age zone; of the solid use of squares as characteristic of 10; of a breakup into many small separate designs or patterns as characterizing 11; of small hollow circles or sharp, small, asymmetric designs as characterizing 13; of extremely symmetric designs as characteristic of 14.

Now it is obvious that no one of these types of pattern will be found exclusively at the age indicated. This is true, in part, because individual subjects cannot all be guaranteed to be developing precisely according to any basic ground plan. Some 13-year-olds, for example, will be immature for 13; some will be advanced. Thus we would expect to find at least a scattering of any one of the above-listed patterns occurring at ages adjacent to the age indicated as focal for the pattern in question. (Also, of course, it would be quite possible for any given pattern to be characteristic of a several-year age zone rather than of any one single calendar year.)

Table 47 shows the extent to which each of the patterns in question occurs at the age at which we assume it to be outstandingly characteristic, and the extent to which it occurs at surrounding ages. No one of the patterns occurs exclusively at the age which we consider it to typify, but, in nearly every instance, it does occur at least twice as much at that age as at adjacent ages.

CULTURAL DIFFERENCES

Other investigators, notably Lowenfeld (1954) and Stewart and Leland (1952), tend to find rather marked differences in Mosaics made by subjects from different cultural backgrounds. Differences which have been most frequently explored are those between Mosaics made by American children and those made by English children. Outstanding differences are that Americans make more unpatterned or poorly patterned products than do the English, and that Americans make predominantly representational, Europeans predominantly symmetric, accurate, patterned abstract designs.

Since the present study is based solely on products of American children, we can do no more than hypothesize, but it is our guess that differences between English and American child subjects might turn out to be considerably less than past studies suggest if subjects in the two groups were scrupulously matched for age, intelligence, and parental occupations.

AGE CHANGES IN INDIVIDUAL SUBJECTS

Longitudinal study of individual subjects suggests that individuality is revealed most fully and fairly by a series of Mosaic patterns made at, say, yearly intervals, rather than by any single product. The present study offers only a preliminary analysis along these lines, but it does suggest the following as examples of *types* of age change in the Mosaic product in the first 16 years of life:

1. Some subjects follow very closely the age pattern changes indicated in this volume, at the ages indicated.
2. Others follow the typical sequence of pattern changes, but a little in advance of or a little behind the timetable given here.
3. Some subjects exhibit yearly variations of some individual basic theme or pattern, rather than following out characteristic age changes.
   a. Some make only abstract designs, though of changing form and pattern.
   b. Some make only scenes.
   c. Some make only slabs.
   d. Some make only objects, though different objects from age to age.
   e. Some make only a board-filling "neurotic" pattern of many small pieces, poorly fitting. In some, islands of form begin to appear with increasing age; in others they do not.
4. There are subjects, usually of limited endowment, who from, say, 10 years or so and following, make some simple, unimaginative product such as a rather rigid "flag" or "airplane" and scarcely vary from this standard product from year to year.

In general, as with the Rorschach or even with ordinary "developmental" behavior tests, we consider it as important to know how the child's response is developing and changing with age as to know how he responds at any given moment on a single test. The response to the single test reveals a certain truth about the individual, but it is only a partial truth and only part of the larger picture of his growing, changing (though in some ways ever-constant) self.

Thus the Mosaic reveals not only the developmental status of the individual at any given age but also, when several tests are available in sequence, the rate and direction of growth.

In our opinion, it is important for any clinician who uses the Mosaic test with children, even if as a novice he may not be fully cognizant of exactly what the age patterning may be from year to year, at least to be aware of the fact that the characteristic pattern does normally change from age to age.

In this connection, though the present study includes only ages from 2 through 16 years, we should like to add a brief summary of a current study on Mosaic responses in elderly people (Pelz, Pike, and Ames, 1962). A population of 56 subjects, aged 70 years and over, was divided, on the basis of the Rorschach response, into four categories: normal, intact presenile, medium presenile, and deteriorated.

These subjects were then given the Mosaic test, and the responses of the four groups were compared. As Table 48 shows, presumably normal elderly subjects constructed Mosaic designs which fall chiefly in the class "object." Intact and medium presenile subjects made mostly patterned designs. Deteriorated subjects made mostly unpatterned designs. Unpatterned designs, as the table shows, increase with increasing deterioration of the subject. Both patterned designs and objects decrease.

This situation is, as might be expected, exactly the reverse of what we find in groups of children of increasing ages. That is, with increasing age in childhood,

Table 48

TYPE OF MOSAIC STRUCTURES MADE BY ELDERLY SUBJECTS

	Normal	*Intact Presenile*	*Medium Presenile*	*Deteriorated*
Number	7	24	15	10
Refusals (%)	14	0	7	10
A. Nonrepresentational without pattern				
1. Just drop or pile (%)	—	—	13	10
2. Scatter singly (%)	—	4	—	10
3. Prefundamental (%)	—	12	13	30
4. Slab (%)	—	4	13	
ALL A (%)	—	20	40	50
B. Nonrepresentational with pattern				
1. Fundamental (%)	—	8	20	20
2. Central design (%)	28	54	26	20
ALL B (%)	28	62	46	40
C. Representational, Object (%)	57	17	7	0
Successful (%)	71	50	40	20
Failure (%)	29	50	60	80

unpatterned designs decrease, with increased age in extreme old age, such patterns increase. As with the Rorschach test, extreme old age brings a reversal of the type of change which occurs with added years in childhood, and the patterns of old people resemble once again those found in earliest childhood.

RECIPROCAL INTERWEAVING

Earlier studies, especially those dealing with expected age changes in the Rorschach test (Ames *et al.,* 1952, 1954, 1959), have emphasized the fact that the child's response in the Rorschach, as in other situations, does not necessarily show consistent and straight-line improvement, or growth in any one given direction, as the child grows older. Thus, in the Rorschach response, we find that ages of expansive behavior tend to alternate with ages of inwardized behavior; ages of disequilibrium with ages of equilibrium.

To some extent this phenomenon of what we term "reciprocal interweaving" is also observed in the Mosaic response as it changes from year to year. Tentatively, we note that typical 10- and 14-year-old products, for instance, are much more symmetric than are those at surrounding ages. Thus, to some extent at least, symmetric and asymmetric responses are interweaving. Furthermore, the child at 4 and 6 years of age uses more pieces than he does at 5; the 14- and 16-year-old uses more than does the 15-year-old.

A fuller longitudinal study, in which all subjects are seen over a period of several years in succession, will be necessary before we can make any definitive statement, but we anticipate that it will reveal aspects of reciprocal interweaving in successive responses to the Mosaic test.

AGE VERSUS INDIVIDUALITY

With the Mosaic, as with any other projective test, it is necessary to evaluate for any product to what extent performance is influenced by age factors and to what extent by individuality factors. Our conclusions as to the Rorschach response in children (Ames *et al.*, 1959, p. 282), where a similar evaluation needs to be made, probably hold, at least to a considerable extent, for the Mosaic:

> Up to 5 or 6 years of age it appears clear that maturity factors outweigh individuality factors of other kinds. From a mixed group of Rorschach records it would probably be easier to sort out the records of the 2-, 3-, and 4-year-olds than to sort out individual children on some personality criterion. Somewhere around 6 or 7 years there appears to be a qualitative shift, and individuality features appear more strongly than before. Group averages and more qualitative patterning features do present a distinctive picture for each successive age, but individual records show considerable variation in their expression of this picture. This period lasts from 6 or 7 years until about 11, and within this period one does not get the impression of individuality being more and more distinctly revealed year after year. Even by 10 years of age, the Rorschach gives a picture of particular child-to-child similarity. The next shift in level occurs around 12 years and seems to represent not simply a waxing of individuality features and waning of developmental features, but an increasing definition of both. Through the adolescent years, we feel that there are rather more clearly discriminate age changes, but that these are expressed by most individual subjects in definite yet *individual* fashion.

Thus in the Mosaic response, even at the earliest ages (as, for instance, at 3 years of age), the performance of the highly superior or creative child stands out even if only in the elaborate and imaginative naming of shapeless groups of pieces. However, for the most part children in the first 7 or 8 years, although to some extent revealing in their Mosaic product both their degree of intelligence and quality of individuality, probably indicate the maturity level of their performance more clearly than anything else. It is noteworthy that it is only the exceptional child whose Mosaic performance is conspicuously beyond his age in years.

It seems to us—though we offer this merely as a hypothesis—that between the ages of 8 and 16 years, in girls, and 8 and 15 in boys, individual children vary in what it is that they reveal most clearly by their Mosaic product. Some tell little beyond the age level at which they are operating. The products of others speak clearly of individuality but do not tell much about age or intelligence. Neurotic products in this age zone are among those which show more about individuality than about age. The products of boys at 16 years are so variable as to speak more clearly of individuality than of any common age factor.

We assume that at some later age, perhaps after 21, age factors play a relatively minor, and individuality factors the major, role.

IMPORTANCE OF FULL RECORDING OF ACCOMPANYING BEHAVIOR

Lowenfeld has emphasized (1954, p. 45) that "It cannot be repeated too often that an understanding of the L.M.T. is gained through detailed analysis of the structure of the response in these *two* aspects: the relation of the subject as an individual to the test, and the study of the design made by him."

We should like to reinforce this warning. We consider the subject's total response, including all of his verbalization while responding, so important that we recommend that the examiner always keep a complete running account as the subject works. Thus complete data on any subject's performance should include not only a copy of the product but also a typescript recording the accompanying behavior and, if possible, all verbalization. (Descriptions of characteristic verbal and other accompanying behavior have been given for each age level discussed.)

DANGER SIGNALS

Beyond reproducing a few presumably neurotic patterns (Plate 32), the present investigation presumes to consider chiefly Mosaic responses of subjects of normal intelligence and normal personality structure. Further study may reveal that some of the patterns reviewed here—even some which we have presented as

Table 49

RESPONSES CONSIDERED BY SOME INVESTIGATORS TO BE ABNORMAL IN ADULTS, WHICH OCCUR NORMALLY AT CERTAIN AGES IN CHILDREN*

Schizophrenic Signs	*Age of Occurrence in Normal Children, Years*
Less than four different colors	4–7, 11–14
Use of squares only or other simple forms	5, 10, especially
White and yellow/blue/green/black	9, 14 in girls
Solid (one) color	6, 12 in girls; 7, 9, 10 in boys
Yellow and black are pathognomic for schizophrenia	13
Several small abstract patterns	5–7, 11
Missilelike objects	5–13 in boys
Religious symbols	16 in girls
Places single pieces on tray	2
Simple grouping, as chains of similar pieces or groups of fragments	3–4
Simple agglutination (slabs) is pathognomic for schizophrenia	5–15
Supersymmetry	14
Neurotic Signs	
Simple geometric shapes	4–8
Takes a long time (presumably over 15 minutes) on a relatively simple pattern	
Attempts to make a pattern, but the pieces get out of hand	
Frame	3, 7–10
Very simple small patterns	4–9
Pattern with hollow center	13
Organic	
Use of few colors	4–7, 11–14
Small, simple, compact designs	4–9
Failure in symmetry	11–13

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* These "signs" are primarily from Wertham (1950) and Wideman (1955). This area is outside of our own experience, but Lowenfeld seriously questions the validity of many of them.

characteristic of certain age levels—may be outside the normal limits. Even at the present state of our knowledge, however, as in the case of the Rorschach, an understanding of age factors can help us distinguish (1) mere immaturity; (2) behavior normal and characteristic of a given childhood age, though perhaps not "normal" in the adult; and (3) behavior which, even in the very young child, may be considered abnormal.

Table 49 presents a list of responses that are considered, by some investigators, to be abnormal *in the adult response,* and indicates those ages, if any, at which these responses occur normally in children. This table suggests that many (perhaps the majority) kinds of Mosaic response which have, by some, been considered to be signs of abnormality *in the adult* may occur quite normally and even normatively at certain ages in childhood.

We then ask what kinds of response or what characteristics of response, if any, are customarily considered to be signs of abnormality or personality deviation *in children.* Combining suggestions made by Lowenfeld, Colm, and others, we obtain the accompanying rather brief list of such signs, reproduced along with the ages at which we ourselves have found these patterns to occur in presumably normal subjects. (See Table 50.)

Table 50

SUPPOSED DANGER SIGNALS IN CHILDREN

Possible Signs of Neurotic Personality or of Maladjustment in Children	*Age of Occurrence in Normal Children, Years*
Slab patterns	4–15
Use of sharp, pointed tiles and then points covered over	14
Kite pattern	3–5
Presumed Signs of Organic Injury	
Lining up tiles of same shape or color, or both	4–7
Repeating a primitive design in shape and color	7, 14, 15
Simple additive placement side by side (slab or less)	4–16
Piles or heaps, same type	2–3

The brief tabulation in Table 50 suggests the conclusion that the Mosaic may give its clearest indication of danger not so much by the specific pattern per se as when it identifies the pattern made by any given child as being conspicuously immature for the age in question, since there seem to be very few of the kinds of response generally considered as atypical, in either children or adults, which do not occur normally and even normatively at some of the earlier ages.

After 5 years of age, however, we would suggest the following kinds of response as probably being signs of danger or at least signs of immaturity:

1. At any age, patterns indicated in the developmental tables as being below age
2. Extreme sparsity of response

3. Conspicuous failure to complete any attempted design
4. Object which conspicuously fails to resemble object named
5. Extremely rigid placement of single pieces or of small patterns
6. Piling and scattering
7. Atypical or pathological content
8. "Neurotic" filling of tray; poor fitting and lack of pattern
9. Unusually unpleasing or ill-fitting slabs
10. Extremely unpleasing or harsh use of color, such as red and yellow only
11. Extremely adverse response to test situations: complaints about the task, the colors, the shapes, the examiner, the entire situation, or own lack of ability

USEFULNESS

We have found the Mosaic to be most revealing when used in conjunction with the Rorschach test. As noted earlier, Lowenfeld considers that, whereas the Rorschach gives evidence as to how the individual experiences, the Mosaic tells how he functions. The two tests, used together, are extremely effective in giving a well-rounded view of the subject.

In clinical practice the Mosaic has proved extremely useful not only in helping us to interpret individuality in the normal child and in spotting marked personality deviations but, even more so, in revealing developmental status. With older children a grossly immature Mosaic can, for instance, help explain school failure. It is frequently a clue to overplacement in school. When the question is one of school readiness, especially readiness for kindergarten and first grade, the Mosaic provides an objective and valuable clue as to the child's developmental level. Distinctions between 2-, 3-, 4-, 5-, and 6-year-old Mosaics are easily made, and the Mosaic product can be a real help in spotting the immature child whose developmental age is below his age in years. Even a beginning worker with the Mosaic can easily make these distinctions.

It would be our suggestion, for the clinician who is beginning to use the Mosaic with children, that, in addition to using the age norms presented here, he might gather tentative normative material of his own. Assuming that the age range of the children with whom he is working is not too great, he could quite easily obtain Mosaics from several successive classes in a local public school. This would give him a basis of material of his own which would help him to arrive at his own notion of what patterns to expect at the different ages.

Use of the Mosaic to reveal various aspects of individuality—both in distinguishing normal from atypical and in distinguishing various kinds of personality within the normal range—is not a task for the beginner but, as in the case of the Rorschach, requires considerable training and experience.

CHAPTER 28

Summary

Lowenfeld tells us:

> The process of acquiring experience in the use of the Mosaic resembles that of acquiring a new language. . . . While each individual expression has qualities that make it unique within a certain range, yet there is a grammar which is used by all; and to understand what is expressed, this grammar must be learned and must indeed become second nature in the tester. When this has come about a mosaic can be read almost as immediately as any other statement in comparable media [Lowenfeld, 1954, p. 152].

We ourselves, though we have been using the Mosaic in our clinical practice for over 12 years, are still adding to our appreciation of what it can tell us of the individual personality and developmental status.

Any new user of this test will need a long period of training and experience before he will be really skilled in its use. Our purpose, in presenting the age-level information in the present volume, is to shorten the learning period for the beginning worker in this field by helping him to become familiar with some of the more characteristic patterns to be expected at each age in childhood. Lowenfeld has emphasized, and correctly, that the whole range of possible designs should be kept in mind as a background for the assessment of any individual pattern. The present manual is directed toward providing such a background. (The best cursory views of outstanding patterns made at each age can be obtained by consulting Table 13, which indicates the leading types of structure at succeeding ages, and from the developmental tables in each age chapter.)

The present study deals with age changes in the Mosaic pattern of presumably normal children between the ages of 2 and 16 years. Subjects for this study were 50 girls and 50 boys at each yearly age level from 2 through 16 years, most of them either from our own research population or from local public and private schools. Most were of superior or very superior intelligence, and, with only a few exceptions, their fathers were of professional or semiprofessional status.

The products were analyzed as to all formal properties of each response—type of structure, form, color, symmetry, compactness, naming, content, number of pieces used, and timing. Following this, an age summary was drawn up to describe typical behavior (boys and girls separately) at each yearly age level.

These summaries included a description of the formal properties of structures at each age, a qualitative description of outstanding behavior, a developmental table to indicate what kinds of behavior are "at age" and "below age," sex differences, a description of verbalization and other accompanying behavior, and plates which illustrate typical patterns.

FORMAL PROPERTIES OF TEST RESPONSES

TYPE OF STRUCTURE

Structures have been classed as nonrepresentational without pattern, nonrepresentational with pattern, and representational. Subclasses are defined within each major class. Nonrepresentational structures without pattern predominate at 2 and 3 years and occur conspicuously at 4 years, but they do not appear thereafter except for the subgroup "slabs." From 4 years and following, except at 15 years, representational structures (that is, objects and scenes) predominate at every age. Conspicuous sex differences are that, at every age from 4 through 13 years, girls make more central patterned nonrepresentational designs than do boys; boys make more representational objects than do girls. At 14 years, the figures are nearly equal; at 15 and 16 years, boys make more central nonrepresentational designs than do girls. Another conspicuous shift with age is that boys make more scenes than do girls at every age from 3 through 9 years, and at 13 and 14 years; girls make more at 10, 11, 15, and 16.

FORM

Form level for representational patterns is divided into four categories: very simple form, simple-popular form, apt or complex form, and clever or ingenious form. Though a substantial number of each sex reach level III (apt or complex form) by 8 years of age, the majority do not respond at level III until 12 years of age. For nonrepresentational designs, six levels of form have been identified: incoherent or formless, islands of form, intermediate spaced-unspaced, slabs, good form, and successful form. Level VI, successful form, is reached by a substantial number of girls by 7 years and by boys at 11 years. The majority, however, do not perform at this level until 14 years for girls, 12 years for boys.

As to the specific shapes used most, fairly conspicuous sex differences are noted. Thus girls use large triangles most from 2 through 5 years of age, squares from 6 through 9 years, scalenes at 10 years, and diamonds at 11 through 16 years, though scalenes tie with diamonds at 14. For boys, large triangles are used most from 2 through 4 years of age and squares from 5 through 13, except that diamonds lead at 9 years and tie with squares at 11, 12, and 13. Equilateral triangles lead at 14 years and diamonds at 15 and 16.

COLOR

The use of color is rated at five increasing levels: no evident color pattern, partial use of color, one color only, full color pattern repeating form, and color adds significance to form. Girls respond predominantly at level IV from 11 years and after, boys from 12 years on.

As to the specific colors used, blue predominates in girls at every age except 9 years, when black comes first; 13 years, when black and red tie for first place; 14 years, when white predominates, and at 16 when black and white tie for first place. Black holds second or first place at 10 of the 15 ages in question. For boys, blue leads at every age except 2 years, when black predominates. Black holds second or first place at 11 ages.

SYMMETRY

This category is evaluated both as to symmetry of the product made and as to placement of the product on the paper. Symmetry is here classified for nonrepresentational patterns only.

The high points for symmetry of pattern occur at 8 to 10 years of age, and from 12 through 16, with special emphasis on 14 years. The low points for symmetry of figure occur especially at 5 and 11 years. Highly symmetric placement of figures is noted at 8 and 9 years and again at 14 and 16 years; extremely asymmetric placement occurs at 5, 11, 12, and 15 years of age.

COMPACTNESS

Compactness is rated at five levels, ranging from level I, at which no two pieces of the design touch at any point, to level V, at which every piece must contact another piece along the length of at least one edge. This rating was made for representational and nonrepresentational products. Combining these two, however, the trend with girls is from a predominance of level I at 2 years, to level II at 3 years, to level IV at 4 years, to level V at 5 years, and thereafter at every age except 7. For boys, all types of pattern combined, level I predominates at 2 and 3 years, level IV at 4 years, and level V thereafter.

NAMING

The method or manner of naming has been classified at 11 different levels (see Table 22) from the simplest, "unnamed," through "color naming," through "pieces scattered, each named," "pieces scattered, whole product named," to "object resembling object named," "design named design," and "scene so named." The majority of subjects have reached mature and accurate stages of naming by 5 years of age, and nearly all by 6 years of age, though even at the oldest ages there are a few subjects who cannot, or do not wish to, name their products.

CONTENT

Content is judged on the basis of what the subject calls his product. All ages and both sexes combined (though data are given on all ages and on both sexes separately), most frequently name (1) design, (2) animal, (3) house, (4) person, (5) building other than house, (6) boat, (7) arrow, rocket, airplane, or kite, and (8) tree.

NUMBER OF PIECES USED

The means and medians have been figured for each sex at each age. In girls, there is an over-all increase from a median of 20 pieces per product at 2 years of age to a median of 35 at 16 years, this high being exceeded only at 14 years. In boys, the age flow is from a median of 23 pieces per product at 2 years to one of 24.5 at 16, with a high point of 32 at 14 years.

TIMING

For both girls and boys there is a general increase with age in the time it takes to complete a product. The medians in girls increase from 4:30 minutes at 2 years to 6:30 at 16 years, with special high points of 10:00 at 11 and at 14 years. The medians in boys increase from 5:00 at 2 years to 6:00 at 16 years, with the longest durations being 12:00 at 11 years and 10:00 at 15 years.

SEX DIFFERENCES

Sex differences have been given in detail not only for each separate attribute, such as color, type of design, size of product, and the like, but also for each age level in our present range. They have also been summarized fully in Chapter 26.

Suffice it to say here, then, that these differences are marked at most ages and for most of the aspects of Mosaic building here considered. Through the first 14 years the patterns made by girls are more conspicuously nonrepresentational, made outstandingly of diamonds and scalenes (10 to 16 years), more varied as to use of color, more advanced as to accuracy of use of color, and less compact than those of boys. Girls make more of such products as grass, trees, and flowers—all considered to be more feminine than masculine symbols.

The products of boys through the first 14 years tend to be more representational than nonrepresentational and more representational than those of girls. Although both sexes use triangular shapes outstandingly in the years from 2 through 4 and squares from 5 through 10, after that boys use, outstandingly, diamonds and squares, and girls use diamonds and scalenes. Boys are less variable in their use of color and less advanced as to accuracy of color use than are girls, but their products are more compact. Boys make more boats, cars, and trains, and rockets, planes, arrows, and kites than do girls.

Girls, in general, follow a little more closely than do boys the patterned age changes as described in this text. After 14 years, the relative predominance of different types of design changes, and, at 15 and 16 years, girls make more representational products than do boys.

The characteristic performance of ages 8, 11, 15, and 16 years is shown most clearly in girl subjects; that of 7, 9, and 10 years, by boys. At 14 both show the age clearly in a similar manner. At 13, boys and girls demonstrate different, though highly characteristic, aspects of the age.

AGE CHANGES

Marked individual differences within any one age, and considerable overlap of the type of product from age to age, make it difficult to characterize any given age as distinguished from those which surround it. In viewing the total age range, however, it becomes clearly evident that, with increasing age, both color and form are used with increasing effectiveness. By the teens, the majority of patterns are surprisingly accurate and effective. With increased age, most designs tend gradually to pull in until they cover less of the board, or, if much space is covered, it is covered effectively and planfully. Slabs finally drop out.

Also, with increasing age, not only are more designs successful and effective but there are fewer different kinds of designs. At 4 years there are 12 different classifications; at 7 years, 10; at 12 years, 9; at 16 years, only 7.

TWO YEARS

Girls. The response here is still chiefly at a manipulative level. Most children either merely drop handfuls of pieces onto the board or scatter pieces singly. Since they often merely dump a handful of pieces as they grab them from the box, the result may be a massing of color which looks more planful than it actually is. Eighteen girls call either the whole product or the single pieces, such names as design, house, and merry-go-round.

The leading type of design is thus nonrepresentational without pattern. Blue is used most and black second, though there is little, if any, selective use of color. The large triangle is the form used most.

Boys. Like girls, boys, for the most part, either drop or pile pieces or scatter them singly. Relatively more boys than girls scatter singly. Eighteen boys name either the total product or single pieces, using names such as house, animal, train, and boat.

The leading type of design is nonrepresentational without pattern. Black is used most and blue second, though there is no evident selective use of color. The large triangle is the form used most.

THREE YEARS

Girls. This is a transitional age between 2, when all girls merely drop, pile, or scatter single pieces, and 4, when only 4 subjects fall in that class. The majority here (31) make nonrepresentational designs without pattern, but, of these, only 7 just drop or pile, 18 scatter singly, and 6 make prefundamentals. Other nonrepresentational patterns include lining up pieces; making a partial or complete frame on one side of the board or on 2, 3, or 4 sides; making a frame and center; or filling corners only. There are 7 objects but no scenes.

Since, as at 2, many girls merely scatter or line up a handful of pieces from the box, the products may consist of a clump or line of pieces all the same color.

Products are named by 33 girls, and these are classed as objects if several pieces are grouped together, even if they do not resemble the thing named. (Single pieces named are not classed as objects.) Blue is the color used most, but there is no evident use of a color pattern in the majority (38) of subjects. The large triangle is the most popular shape.

Boys. There is marked improvement over 2 years of age. Although 10 boys still scatter single pieces, nonrepresentational designs without pattern have decreased from 48 to 25. There are 12 prefundamentals. Nonrepresentational designs without pattern have increased from 2 to 9; representational patterns from 0 to 16, with 6 scenes and 10 objects.

As with girls, many of the "objects" named do not resemble objects, but 27 boys do name their products. Rather advanced boys may line up pieces of one type and call them choo-choo train. Blue is the leading color, but, as with girls, no evident use of a color pattern prevails in 42 subjects. The large triangle is the leading shape.

Verbalization about the product may be considerably ahead of the actual structure.

FOUR YEARS

Girls. There is a tremendous variety of response here, and a great advance since 3 years of age. Now only 14 girls make nonrepresentational designs without pattern, 7 of them being prefundamentals; 16 make nonrepresentational designs with pattern, 11 of these being central designs and 3 being fundamentals; 18 make objects.

Conspicuous are 7 vertical lines of triangles and 5 squares. There are 5 basic circles, each made of 6 large triangles, either alone or as a part of the design or object. Many patterns are named object and so classed, though they do not resemble the thing named. Small 2-piece houses are made by 4 girls. Several of the more superior make small but nicely spaced designs. Large triangles are the leading form used. Blue is the leading color, with red second. There are many small islands of form where color is used selectively, even though color use in the total products is not accurate. Most products cover less of the paper than earlier.

Boys. There is great advance here over 3 years. Nonrepresentational designs without pattern have dropped from 25 to 14. Patterned nonrepresentational designs have risen from 9 to 13, and, of these, 6 are central designs. Objects have increased from 10 to 20, and there are 3 scenes.

Products are named by 27 boys, though many products which are named objects (and which we have thus classed as objects) are merely fundamentals or mere clusters of pieces. Conspicuous are 11 basic circles, each made of 6 large triangles, or modifications of this pattern; there are 8 lines of squares, 2 lines of triangles, and 2 of diamonds; and 3 boys make 2-part houses. Blue is the leading color, with green second, and, for representational objects, there is partial use of color consistent with form.

Four-year-olds tend to joke, often behave in a rather silly manner, and talk almost continually, either directly to the pieces, about what they are making, or about outside activities and interests.

FIVE YEARS

Girls. The leading type of structure for girls is now representational—22 objects and 3 scenes. Objects are about equally divided between those in which the pieces are used as paint (7), use of 2 to 5 pieces combined cleverly and effectively in small patterns (6), and good large or complex objects which include large open square structures, especially houses (7). There are at least 8 small 2-piece houses of a square capped with a small triangle and 9 in which pieces, especially squares, are lined up. There are at least 15 small, compact, patterned designs or slabs, and only 7 unpatterned nonrepresentational designs.

There is considerable experimentation with different types of combinations of colors or shapes. Thus pieces may be placed point to point instead of merely side by side. Blue is the leading color used, and black is second. The chief level for use of color is partial use of color with no relation to form, for nonrepresentational designs, and partial use of color consistent with form for representational objects. Squares and large triangles tie for first place.

Boys. By far the leading type of structure is representational—29 objects and 5 scenes. The objects are chiefly made from separate pieces used as paint (11), are good large or complex structures including large open square objects, especially houses (10), or consist of 2 to 5 pieces cleverly combined (7). As with girls, in both designs and objects there are many in which squares or other shapes are lined up, in which the structure consists of a 4-year-old basic circle or an elaboration thereof, or in which the subject makes a large square of 9 or more squares. There are many (12) small compact objects or designs. There are now only 4 nonrepresentational designs without pattern.

Blue is the color used most; red second. For both representational and nonrepresentational designs, there is partial use of color consistent with form. Squares are used most, then large triangles.

Fives are less silly, quieter, and less talkative than Fours. Their response is more workmanlike, and their products are more likely to be "successful" from an adult point of view. In many, the mechanism of performance, rather than the mere product, seems to be of primary interest.

SIX YEARS

Girls. There is great variation, but by far the outstanding products are objects (23) and scenes (9). The majority of objects are effective, accurate, and complex, and they resemble what they are named. Houses (13) lead, many being large open structures made of squares. Scenes typically include house, grass, and sky, constructed in horizontal rows. Central designs (10) are prominent but varied in type.

There is much experimenting with different kinds of combinations of pieces. This may be of different forms, different colors, or different position of pieces. Blue is used most; green and red come next. Color tends to be at the level of partial use of color consistent with form. There is interest in combinations of twosomes, threesomes, or even foursomes of the same shape or color. Color tends to mass or alternate. Some subjects use all six colors alternately. The outstanding shape is the square, followed by large triangles.

Boys. Boys make chiefly objects (24) and scenes (13) and more of both than do girls. The scenes resemble those of girls. Objects, mostly houses and arrows or jets, are made somewhat less maturely than are those of girls, boys mostly using either from 2 to 5 pieces in effective arrangements to resemble the objects named, or making large, complex, successful combinations of pieces resembling the objects named.

Blue is the color used most, green coming second. The outstanding color category is partial use of color consistent with form. Squares are used most, followed by large triangles.

Nearly all children of both sexes can make a successful design or object which satisfies the maker. In contrast to the relatively silent, or at least quiet, 5-year-old, Sixes tend to chatter away in such an expansive manner that, in some instances, conversation interferes with their work.

SEVEN YEARS

Girls. The outstanding characteristic of this age is the serial or linear placement of single pieces or objects. Single pieces may be aligned to form a central design (of which there are 10). Objects may be aligned to form a scene. Representational patterns (27) now lead. There are more scenes here (16) than at any age except 16 years. The scenes differ from those made at 6 years by being simpler and often without the sky. There are many houses. Objects now are constructed rather complexly, and most resemble what they are named.

There is great interest in the varied manipulation of color. Thus products may consist of a whole row of different-colored houses. In designs, color contrast is more apt to be horizontal than vertical. Blue leads, and black comes second. The level of color use is the highest to date—full color pattern repeating form for nonrepresentational patterns—and is actually better than at 8 years. Squares lead other shapes in frequency of use, large triangles coming second.

Boys. Serial or linear placement of pieces is the outstanding feature at this age and is even more conspicuous in boys than in girls. Of the 50 boys, 26 produce outstandingly linear patterns. Representational patterns definitely lead, with 18 objects and 17 scenes (more than at any other age). As with girls, Sevens stress the horizontal line-up of pieces and give less emphasis to sky regions than do Sixes. Also as with girls, the objects are mostly beyond the 2- to 6-piece simple level. Frames, when made, may balance in color.

Blue is the color used most, and black comes next. The use of color is similar to that in girls for representational objects, but it is slightly less good for nonrepresentational objects. Squares lead as to shapes, and diamonds come second.

Seven-year-olds seem much calmer than Sixes. Many merely whisper to themselves as they work, instead of chatting with the examiner, and they seem much less sure of themselves and of their own ability: "Don't know what I'm going to make"; or "I'm not too good at this."

EIGHT YEARS

Girls. The products are now larger, cover more of the page, and are more variable at this age than at 7 years, making it more difficult to define central trends. In fact, variety and multiplicity are the outstanding characteristics. This variety may be achieved by odd placement on the paper, by making several different small products, by variety in color use, by adding pieces at odd angles, or by adding one incorrect shape or color to an otherwise accurate product.

The leading types of product are objects (14) and scenes (11), both of which feature 2-piece houses, several to a page, placed either in rows or in an odd orientation which presumably indicates perspective. Scenes, for the most part, consist of houses and trees. Central designs (9) are predominantly symmetric and often somewhat linear. There are remnants of 4-year-old basic circles.

In spite of frequent linearity, a solid mass of pieces characterizes many 8-year-old products. Frame-and-item designs occur here more than at any other age. Large slabs are conspicuous. Blue is the leading color, followed by black. Squares are used most, the large triangle next.

Boys. As with girls, the products are rather varied and tend to be large and more solidly massed than at 7. There is much interest in mere manipulation and placement of pieces. Objects (20) and scenes (14) predominate. Most conspicuous are buildings—10 houses and 10 other buildings—for the most part slightly more complex than those made by girls. Animals, cleverly fitted, are also conspicuous, as are phallic-looking arrows and rockets. There are also, as with girls, variations on the 4-year-old basic circle, and several frame-and-item designs. As with girls, there are several excellent symmetric patterned designs.

Blue is the leading color, and black comes second. Squares are the leading shape, with diamonds coming second. Eight-year-olds are very talkative during the test, and use elaborative adjectives in naming their products. Many show good imagination, seeming to think first of what they want to make and then seeking the necessary pieces. There is some silly talk as at 4, or they speak directly to the pieces. Eights tend to belittle their own products: "Not much of a house."

NINE YEARS

Girls. The products are even more varied than at 8 years of age. Not only are 10 different classifications represented, as opposed to 7 at 8 years, but great extremes in response appear, designs being often either very large (larger than at 8 years), or very small (small blue or black figures). Marked integration is seen here in many, but both color and form are used effectively, and patterns and products seem more orderly than earlier.

For the first time, patterned nonrepresentational designs are equal in number to representational designs. This emphasis on nonrepresentational patterned designs occurs here in girls for the first time, drops out at 10 and 11 years, and is seen again strongly at 12 and 13 years. The largest single item is central design.

Black is the leading color, and blue comes next. The use of color is still conspicuously "partial use of color consistent with form," but there is often excellent balance of color as well as of shape. In many products there is one offbeat color. Squares still predominate, and diamonds come second.

Boys. Boys show, more conspicuously than do girls, the small black and/or blue patterns so characteristic of this age, 11 products being all or nearly all black or blue. Absence of red is conspicuous. Color is being used more effectively in both representational and nonrepresentational products. Even scenes tend to be small clumps of dark colors.

There may be single rows of houses, slightly embellished; phallic-looking vehicles may be stressed; or there may be blue, white, and black water scenes.

As usual, with boys, representational objects far exceed nonrepresentational. For the first time, diamonds are the predominant shape.

The 9-year-old is quieter again and far less talkative than at 8, less silly and exuberant, less likely to disparage his own product. Nines often try to carry out, and in considerable detail, rather complex ideas.

TEN YEARS

Girls. Though fewer different classification categories are represented here than at 9 years, girls' products seem to be extremely varied at this age. This is partly because there are the fewest nonrepresentational designs with pattern of any age (except 11 years which has exactly the same number) in the 10- to 16-year range. The small number of central designs, the large number of varied scenes (largest to date), and the large number of slabs (most to date) contribute to the impression of variety.

Many products are large and bulky, and there are more designs filling the whole tray than at any other age from 10 to 16. More pieces are used, on the average, than at any age to date, and the mean time of building is the longest to date. Scenes, especially, are larger than at any age to date, and they feature fewer houses or people but many horses and other animals and many water scenes.

Scalenes are the leading shape at this age only; diamonds come next. Blue is the leading color, with green next. For representational objects, there is a sudden increase in naturalistic use of color.

Boys. Outstanding is the use of squares, the predominant shape used at this age; some children use squares only, making large square central designs. There are many square buildings. Red and black are the predominant colors. For representational objects, full color pattern repeating form is definitely the leader.

Boys make more representational objects than at any other age from 10 to 16 years (34 in all). Of these, 13 are scenes, and 21 are objects. Rockets are the outstanding objects being made, chiefly of squares with side projections. Several of the "men" resemble rockets.

Conspicuous at 10 is the easygoing, undemanding attitude which the subject shows toward his product. There is also a frequent lack of any clearly formed plan.

ELEVEN YEARS

Girls. The distribution of types of pattern is similar to that seen at 10 years: representational patterns lead, with objects the leading subclass. There are 9 central designs and 6 slabs. Most characteristic of the age is the breakup of the solidness of Ten into smaller bits. This is a low point for compactness. Products are large, sprawling, messy, and appear to be flying apart. Collections of separate patterns as well as scenes and over-all designs cover much of the paper. These scattered collections of items include 6 designs and 4 objects. Scenes are fewer than at 10.

Diamonds, with their possible sexual implication, are the leading shape, and scalenes come second. Blue is the leading color, with white second, and green third. Full color pattern repeating form is used most in nonrepresentational designs; naturalistic use of color adding significance to form leads in representational designs.

Boys. The distribution of types of pattern is similar to that seen at 10 years: representational patterns lead, with objects (27) the leading subclass. There are 5 central designs and 5 whole patterns filling the tray. The central trends are difficult to determine in boys at 11. The key to the performance here seems to be in the pulling in of patterns and in the quality or nature of the objects made. The majority (20) are quite clearly phallic in shape. Guns and boats lead. Thus, while girls' patterns seem to be bursting apart, boys are pulling in to make sharp, pointed figures of clearly phallic design.

The diamond and square tie for first place as to shape. Blue is the leading color, with black, red, and white tied for second place. The level of color use is extremely varied.

The outstanding characteristic of the child's behavior as he works is his almost constant criticism and complaint—against the pieces, against the total situation, against his own performance and product. Elevens also seem to fumble and spill a good deal.

TWELVE YEARS

Girls. Most conspicuous is a change from representational designs, as at 11 years, to nonrepresentational designs with pattern as the leading type. Central designs have increased to 17. The products now are of considerably better form than earlier, being neater and better balanced. After the breaking up of Eleven, the products seem to be coming back together, but in individual ways, depending on the maker. There is a tendency, however, toward shapeless perseveration, some designs are large and spread out, and there are several filling the whole tray.

Blue is the color used most, with black, green, and red tying for second place. Full color pattern (with nonrepresentational designs) and naturalistic use of color adding significance to form (representational designs) are the leading uses of color. Diamonds lead, and scalenes come next.

Boys. As with girls, individual differences are more conspicuous than central trends. Representational objects predominate, and the majority of these represent some kind of vehicle or projectile—rocket, car, train, or boat. Even some of the people are somewhat projectile in form. Conspicuous among nonrepresentational designs are well-balanced circular figures, diamond-shaped masses of diamonds, and "grip-tooth" central designs. Centers are emphasized. Slabs are conspicuous and seem characteristic of the age, being colorful, sprawling, and relatively shapeless.

Blue is the leading color, followed by black. Full color pattern repeating form is the leading class of color used for all types of patterned designs, both representational and nonrepresentational. Diamonds and squares tie for first place.

Typical of Twelve is a definite pertness on the part of girls, an air of banter on the part of boys. Most show considerable enthusiasm about the whole situation. Most Twelves work rather quickly and effectively (even when making slabs), as contrasted with Elevens' fumbling, spilling, and indecision.

THIRTEEN YEARS

Girls. As at 12 years, nonrepresentational patterned designs lead, with 20 of these being central designs—by far the leading category. There is a real pulling in toward the center, the design being mostly compact, with sharp outlines. Small hollow-centered circles and sharp black outlines are characteristic. The compactness of Thirteen seems to represent the climax of an introversive tendency toward pulling in and compactness. There are many slabs, but this is a low point for scenes. Trees and flowers are conspicuous among objects.

Though black and red tie for first place, there is a strong use of black and yellow. The level of color use is slightly less good than at 12 years. Diamonds lead, and scalenes come second.

Boys. The pulling in tendency observed in girls is also observable in boys (many hollow-centered circles) but the products of boys are better patterned than those of girls, boys making only one nonpatterned nonrepresentational design. Representational designs, as usual, lead in boys over nonrepresentational, there being 19 objects and 10 scenes. Houses, vehicles, and persons are conspicuous. Boys also make abstract designs and have a tendency to use single chips as *standing* *for* persons or objects. This gives the scenes a sketchy, abstract appearance. Cars, trains, and sports scenes reflect the major interests of boys of this age.

Blue is the leading color, with black and green tied for second place. Full color pattern leads in nonrepresentational designs, partial color pattern in representational. Diamonds and squares tie for first place.

Not only are the products smaller, neater, and better organized than at 12 years, but the subject's attitude tends to be quieter, more reserved, and less positive and enthusiastic than a year earlier. Many neither talk nor smile as they work. If they do verbalize, their comments tend to be negative and critical.

FOURTEEN YEARS

Girls. Nonrepresentational designs with pattern still predominate as at 13 years. Perhaps the biggest change is that slabs have virtually dropped out, and scenes have increased. The largest single item, however, remains central design. Outstanding is the marked symmetry both of design and of object. Central designs are beginning to open out after the extreme drawing in of Thirteen.

The leading color used is white, with blue second. In general, however, the use of colors is more varied, and most patterns are brighter than a year before. Full color pattern repeats form in nonrepresentational designs, and adds significance to form in representational patterns. Diamonds and scalenes tie for first place.

Boys. Representational patterns now lead, but, as with girls, central designs are the leading single design. Boys show the extreme symmetry (of both color and shape) even more than do girls. As do girls, many boys make a central design which is first smooth, then jagged, then smooth (or vice versa) on its outside circumference.

Fourteens tend to have rather high standards for their own productions. Criticism is now of their own abilities rather than of the examiner or of the test. There is less verbal interchange with the examiner than earlier. The products are fluid, flexible, and changing. Many subjects seem to be using more pieces, shapes, and colors than they can manage effectively.

FIFTEEN YEARS

Girls. Now representational patterns just slightly exceed nonrepresentational designs with pattern, though central design is the leading single type. The products are now smaller, less symmetric, less compact, involve fewer colors, and give special emphasis to blue, which leads, and to red and black, which tie for second place.

Though many central designs are still symmetric, characteristic of the age are the asymmetric, one-sided, and off-center fluid qualities of many patterns, and the use of dark color, whirling design, and scalenes. There is a high incidence of people. Scenes are typical adolescent nature scenes, or such concepts as "fox hunt," or "sailing regatta." The level of color use is the same as at 14. Diamonds are used most, and scalenes come next.

Boys. Boys, for the first age since 3 make more nonrepresentational designs with pattern than representational patterns. Central designs are by far the leading pattern. The products of boys are more varied but, for the most part, more symmetric than those of girls. Conspicuous are whirling, clamp-shaped, or hollow-centered designs. Scenes often represent sports events.

Blue and red and combinations of these two colors are conspicuous. The level of color use is less advanced than at 14 years. Diamonds are used most, squares second. There is either no conversation or a predominance of negative remarks.

SIXTEEN YEARS

Girls. Representational designs are now the leading type, exceeding nonrepresentational designs with pattern even more than at 15 years. Scenes now are the leading single pattern, just barely exceeding central designs. These scenes tend to be bright and colorful, sometimes heavily massed, and emphasize trees, grass, and sky. Black and white tie for first place, but there is more variety of color than just earlier.

Central designs are largely symmetric as to both color and shape, and they tend to be opening out. There is some piling or overlapping of pieces, giving a somewhat shaded effect. Several subjects make what they call "abstractions." There is a marked increase in over-all unpatterned designs, emphasizing the expansiveness and lightness of the age. Diamonds lead, and scalenes come second.

Boys. Nonrepresentational patterned designs predominate over representational even more clearly than at 15 years, thus continuing the reversal of the earlier position of boys and girls. Central designs are definitely the leading single pattern. As with girls, these patterns tend to be somewhat loosely designed and are opening out. Scenes have fallen off sharply. Vehicles are the leading objects.

Blue is used most, red second. Full color pattern repeats form for the largest number of both representational and nonrepresentational patterns. Diamonds are used most, small triangles second.

General behavior patterning as related to the Mosaic seems quite clearly different for superior and mature Sixteens as compared to the less superior and less mature. The less well-endowed subjects approach the task with little enthusiasm and considerable apathy and disinterest—more like Fifteens. Seemingly better-endowed Sixteens express marked enthusiasm and interest. They seem to enjoy the test, want to know what it proves about themselves, and show interest in perfecting their final product.

To appreciate the contribution which the Mosaic can make to understanding any individual child, it is important to keep clearly in mind the distinction between the function of such a test as the Rorschach and of the Mosaic. The

Rorschach is presumed to give clues as to how the individual experiences; the Mosaic, as to how he functions. There are highly gifted individuals, who may be assumed to experience very richly, who, nevertheless, may function ineffectively. Conversely, there are others, as in cases of high-grade mental defect, who experience life in a very limited way, at least as reflected in their Rorschach response, but who function, in their limited way, quite effectively. Thus, though their potentials may be limited, the Mosaic may show them to be functioning adequately at their chronological age level.

The two tests support each other effectively, in theory and, in our experience, in practice, by giving information on two quite different aspects of individuality.

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INDEX

Abstract designs, 78, 79
  in children, 44, 180
  in neurosis, 35
  meaning of, 44
Abstractions, 179
Abt, L., 286
Accompanying behavior:
  at 2 years, 94
  at 3 years, 100
  at 4 years, 106
  at 5 years, 112
  at 6 years, 118
  at 7 years, 124
  at 8 years, 131
  at 9 years, 139
  at 10 years, 146
  at 11 years, 151
  at 12 years, 157
  at 13 years, 163
  at 14 years, 169
  at 15 years, 175
  at 16 years, 213
  importance of recording, 265, 266
Adjacent ages:
  comparison of patterns at, 261, 262
    table of, 261
Administration of test, 11–13
Aesthetic appearance:
  scoring of, 26, 260
  of slabs, 221
Age, vs. individuality, 264, 265
Age changes:
  in centers, 225
  in color:
    process, 70–73
    use, 63–72
      table of, 66, 70
  in compactness, 84–87
  in content, 30, 75–79
  at different age periods, 245
  in form level, 55–62
  in houses, 227–229
  in individual response, 242–245, 262–264
  in individual subjects, 244, 245, 262–264, Plates 30–32
  literature on, 14–20
    summary of, 273–283
  in naming, 75–79
Age changes, in naming (*continued*)
    level of, 75
      table, 76
  in number of scenes, 234
  in persons, 232
  in shape, 59–62
  in slabs, 216
  in success of pattern, 87–89
  in symmetry, 82–84
  in things named, 78, 79
    sex differences in, 78
  types of, 262–264
  in types of structure, 47–54
    table of, 48, 49
Age characteristics:
  at 2 years, 91–95, 273
  at 3 years, 6, 96–101, 273
  at 4 years, 6, 102–107, 274
  at 5 years, 108–113, 275
  at 6 years, 6, 114–119, 275
  at 7 years, 120–125, 276
  at 8 years, 19, 126–133, 277
  at 9 years, 134–140, 277
  at 10 years, 141–146, 278
  at 11 years, 6, 147–152, 279
  at 12 years, 6, 7, 153–158, 279
  at 13 years, 6, 7, 159–164, 280
  at 14 years, 7, 165–170, 281
  at 15 years, 171–176, 281
  at 16 years, 177–180, 213–214, 282
  of Mosaic product, 4, 5, 6
Age levels. *See* Two years, Three years, *etc.*
Agglutinations, 50
Aggressiveness, 42, 43, 44, 260
Airplanes, representations of, 78, 79, 248–250
  sex differences in frequency of, 30
  See also Masculine symbols, Phallic
American Mosaic Conference, First, 20, 73
American Mosiac patterns, compared with European, 7, 8, 16, 17, 38–40, 262
  color use in, 74
Ames, L. B., 4–7, 12, 156, 180, 263–265, 284, 285
Animals, representations of, 78, 79
Apathy:
  at 15 years, 175, 176
  at 16 years, 213, 214
Apell, R. J., 4

Arrow, representations of, 78, 79
Asymmetric patterns:
  at 13 years, 261
  at 15 years, 173, 174
Atypical response. *See* Danger signals, Mental disease, Neurotic products

Basic theme, in patterns:
  variations on, 242–244, Plates 30–32
Behavior during test. *See* Accompanying behavior
Belittling own product, 131, 132, 175
BELLAK, L., 286
Binet test, 29
BINZ, E., xii
Black, use of:
  at different ages, 66–70
    at 15 years, 173
    figure illustrating, 67, 68
    table, 66
  in neurotic patterns, 36
  and red, at 15 years, 173
  significance of, 73
  and white, 73
  and yellow, at 13 years, 161
Blue, use of:
  at different ages, 66–70
    figure illustrating, 67, 68
    table, 66
  with red and black, at 15 years, 173
  significance of, 74
Boats, representations of, 78, 79, 248–250
  See also Masculine symbols
BOURGEOUS, M. E., xii
BOWEN, B., 284
Boy. *See* Persons
Brain injury, products of children with, 31
Breakup of pattern at 11 years, 149, 150, 261
Buildings, 78, 79
  See also Houses
BULLIS, G., 284

Cars, representations of, 78, 79, 248–250
  See also Masculine symbols
Centers, of designs, 224–226
  age changes in, 225
  empty, 156
  hollow, 161, 162, 168, 174
  red, 156
  sex differences in, 225
  table, 226
Central designs, 47, 51, 96, 102, 108, 114, 120, 126, 134, 141, 147, 153, 159, 165, 171, 177
  illustrated, 107, 113, 119, 133, 140, 146, 152, 158, 164, 170, 176, 214, Plates 3–6, 8–18
  tables, 48, 49
Changing of plan, 170
Characteristic behavior at different ages. *See* Accompanying behavior
Characteristic patterns at each age, 261, 262
  See also Qualitative analysis
CHASE, J. A., 18, 284
Circle:
  4-year-old, 104, 111, 117, 123, 261
  hollow-centered, at 13 years, 161, 254, 261
Clamp-shaped pattern, 156, 174
Classification of Mosaics:
  color, 63–74
  compactness, 84–86
  form level, 55–62
  literature on, 22–25
  naming, 75–79
  number of pieces, 80
  of products, 87, 88
  success of pattern, 87
  symmetry, 82–84
  systems of, 22–24
  table of, Lowenfeld, 24
  timing, 81, 82
  type of structure, 47
"Clever" form, 57, 59
COLM, H., 3, 23, 31, 42, 267, 284
Color:
  combinations of, 69
  levels of use of, 63–66
    at different ages. *See* Quantitative analysis
      sex differences in. *See* Sex differences, at different ages
    in nonrepresentative designs, 63, 64
    tables of, 64, 65
  manipulation of, 122
  naturalistic use of, 64, 65, 141, 147
  in neurotic products, 36, 37
  one only, 69
    table of, 70
  in organic subjects, 37
  process of use, 70–73
  in products of defectives, 29
  in schizophrenics, 33, 37
  scoring of, 260
  summary of, 270
Colors:
  number used in slabs, 218, 219
  use of all six, 129
  used at different ages, 63–74
    figure illustrating, 67, 68
    sex differences in, 63–70, 247
      See also Sex differences, at different ages
    table of, 66
    See also Quantitative analysis
  See also Black, Blue, Green, Red, White, Yellow
Compactness, of patterns, 84–87
  at different ages. *See* Two years, Three years, *etc.*
  sex differences in, 85, 86, 251
  summary of, 271
  tables of, 85, 86
  See also Quantitative analysis
Complaints. *See* Criticism, Negative remarks
Confabulation, 136
Content of patterns:
  age changes in, table, 78, 79
  related to personality factors, 44

Content of pattern (*continued*)
  scoring of, 260
  sex differences in, 30, 78, 248
Cornell-Cox test, 29
Corners, placement of pieces in, 35, 98
Counting pieces. *See* Quantitative analysis
Creative products, 244, 265, Plate 32
Creativity, 42, 43, 260
Criticism:
  of examiner, 151, 169, 176
  of products, 131, 132, 151, 163, 169, 175, 176
Cultural differences:
  in European and American patterns, 7, 16, 17, 38–40, 262
  literature on, 38–41

Danger signals, 266–268
  in children's responses, 267, 268
    table of, 267
  table of, 266
Defectives. *See* Retarded subjects
Depressive states, 32
Design:
  along rim, 47, 51, 91, 96, 102, 108, 114, 134, 141, 147, 153, 159
  central. *See* Central designs
  at different ages. *See* Two years, *etc.*, Tabular summary
  filling tray, 48, 49, 96, 102, 114, 120, 126, 134, 141, 147, 153, 159, 165, 171, 177, Plate 3
  formal properties of:
    color, 63–74
    compactness, 84–87
    content, 30, 75–79
    form level, 55–62
    literature on, 22–25
    naming, 75–79
    number of pieces, 80
    shapes used, 59–62
    success of pattern, 87–89
    symmetry, 82–84
    timing, 81, 82
  jagged, 168
  mixed, 47–49, 53
  nonrepresentational:
    with pattern, 47
    without pattern, 47, 50
  representational, 47–52
    objects, 47, 52
      See also Objects
    scenes, 47, 52
      See also Scenes
  sex differences in, 54
    at different ages. *See* Sex differences, at different ages
  systems of, 22–24
  tables, listing types of, 48, 49
  types of, at:
    2 years, 91, 92
    3 years, 96–98
    4 years, 102–104
    5 years, 108–110
Design, types of, at (*continued*)
    6 years, 114–116
    7 years, 120–122
    8 years, 126–128
    9 years, 134–136
    10 years, 141–143
    11 years, 147–149
    12 years, 153–155
    13 years, 159–161
    14 years, 165–167
    15 years, 171–173
    16 years, 177–179
  types of structure, 30, 47–54
    nonrepresentational:
      with pattern, 51
      without pattern, 50
    representational, 52–58
    table of, 48, 49
    tabular summaries at different ages, *see* Tabular summary
Developmental changes:
  in Mosaic product, 4, 5
    See also Age changes
  in Rorschach product, 5
Developmental interweaving, 7
Developmental level:
  and Mosaic test, 4
Developmental status revealed by Mosaic test, 263, 268
Developmental tables, at:
  2 years, 93
  3 years, 99
  4 years, 105
  5 years, 111
  6 years, 117
  7 years, 123
  8 years, 130
  9 years, 137
  10 years, 144
  11 years, 150
  12 years, 156
  13 years, 162
  14 years, 168
  15 years, 174
  16 years, 180
Diagnosis with Mosaic test:
  literature on, 31–38
    brain injury, 31, 32
    dementia paralytica, 31
    mental diseases, 32–35
      depressive states, 32
      manic-depressive, 33
      manic states, 33
      schizophrenia, 31, 33–35
DIAMOND, B. L., 20, 21, 23, 25, 29, 30, 32–35, 284
Diamond shape:
  age changes in use of, 59–62
    chart showing, 59, 60
  figures made with, 248
    table of, 250
  predominance of, at 9 years, 134, 135
  sex differences in use of, 59, 60
    table of, 61

Disease. *See* Mental disease, Organic disease
Dörken, H., 20, 22, 27–30, 34, 35, 284, 285
Dropping pieces, 48, 50, 91–93, 96, 102

Edge patterns, 35, 51
  illustrated, 101, Plate 2
  See also Design, along rim
Eight years, 19, 126–133
  accompanying behavior, 136
  belittling own product, 131, 132
  developmental table, 130
  illustrations, 133, Plates 8, 9
  manipulation of pieces by, 129
  multiplicity of, 129
  percentage each type product, 126
  process of color use, 72
  qualitative analysis, 128
  quantitative analysis, 126
  sex differences, 126, 128, 131, 253
  tabular summary, 126
  talkativeness at, 131
  variability of, 128, 129
  verbalization, 131
Eighth-grade products, 17
  neurotic vs. normal, 37
  sex differences in, 30
Elderly subjects:
  Mosaics of, 263, 264
    table of, 264
Eleven years, 6, 147–152
  accompanying behavior, 151
  breakup of pattern at, 149, 150, 261
  development table, 150
  illustrations, 152, Plate 12
  percentage each type product, 147
  phallic nature of products, 150
  qualitative analysis, 149
  quantitative analysis, 147
  scattered patterns at, 149, 261
  sex differences, 147, 149, 151, 254
  tabular summary, 147
  verbalization, 151
Ellenberger, H., 31–35, 284
European Mosaic patterns, 7, 8
  and American, 7, 8, 16, 17, 38–40, 262
  color use in, 74
Evaluation of product, 4–7, 259
  See also Scoring of Mosaic test
Expansion:
  of behavior, 7
  of product, 6
Eysenck, H. J., 20, 21, 23, 29, 285

Faces, designs representing, 78, 79, 231
  neurotic aspect of, 232
Feminine symbols, 79, 248–250
  table of, 249
  See also Sex differences, in content of design
Fifteen years, 171–176
  accompanying behavior, 175
  color used, 171–173
Fifteen years (*continued*)
  developmental table, 174
  illustrations, 176, Plate 17
  negative attitude of, 175, 176
  neurotic pattern at, 173, 174
  off-center pattern at, 173, 174
  percentage each type of product, 171
  persons stressed, 172, 173
  qualitative analysis, 173
  quantitative analysis, 171
  sex difference, 171, 173, 174, 255
  tabular summary, 171
  variability of Mosaics, 173
  verbalization, 175
First American Mosaic Conference, 20, 73
First grade products, 14
Five years, 108–113
  accompanying behavior, 112
  colors used, 108, 109
  developmental table, 111
  illustrations, 113, Plate 5
  percentage each type product, 108
  process of color use, 71
  qualitative analysis, 110
  quantitative analysis, 108
  sex differences, 108, 110, 111, 252
  tabular summary, 108
  verbalization, 112
Flexibility of behavior, 170
Flowers, 78, 79, 229, 248–250
  sex differences in frequency, 30
  See also Feminine symbols
Fluidity of behavior, 170, 173
Flum, T., 29, 284
Food, products categorized as, 75
Form of Mosaic:
  scoring of, 260
  summary of, 270
Form level, of products, 55–62
  at different ages. *See* Two years, Three years, etc.
  of nonrepresentational designs, 55
    sex differences in, 56
    table of, 56
    See also Quantitative analysis
  of representational designs, 56–59
    sex differences in, 57
    table of, 58
    See also Quantitative analysis
  sex differences in, 246
    See also Sex differences, at different ages
Formal properties of products. *See* Products, formal properties of
Four years, 6, 102–107
  accompanying behavior, 106
  circle, 104, 111, 117, 123, 261
    illustrated, 107, Plate 3
  colors used, 102, 103
  illustrations, 107, Plates 3, 4
  percentage each type product, 102
  process of color use, 71
  qualitative analysis, 103
  quantitative analysis, 102

Four years (*continued*)
  sex differences, 102, 103, 105, 252
  tabular summary, 102
  verbalization, 106
Fourteen years, 7, 165–170
  accompanying behavior, 169
  change of plan, 170
  criticism by, 169
  developmental table, 168
  illustrations, 170, Plate 16
  percentage each type product, 165
  qualitative analysis, 167
  quantitative analysis, 165
  sex differences, 165, 167, 168, 255
  similarity of sexes, 167, 168
  symmetry, 166, 167, 261
  tabular summary, 165
  verbalization, 169
"Fox" pattern, 57, 59
Frame, patterns related to, 35
Frame-and-item pattern, 47, 52, 96, 102, 108, 114, 120, 126, 134, 141
  high point for, 129, 130
  illustrated, 133, Plate 8
  levels of, 98
  tables, 48, 49
Fundamentals, 47, 51, 96, 102, 126
  illustrated, Plate 9
  tables, 48, 49

Gelbmann, F., 30, 284
Gerson, E., 29, 286
Gesell, A., xii, 6, 7, 156, 284, 285
Gesell Institute, 9
Gifted products, 244, Plate 32
Girdner, J. B., 27, 28, 285
Girl. *See* Persons
Golden, L., 20, 31, 33, 286
Goodenough, E. W., xii, 12
Goodenough Draw-a-Person test, 29
Gorman, M. M., 20, 285
Grass, 78, 79, 248–250
  See also Feminine symbols
Green, use of:
  at different ages, 66–70
    figure illustrating, 67, 68
    table, 66
  significance of, 74
"Grip-tooth" pattern, 156, 174
Growth, rate of, 263

Hamden Hall, 9
Himmelweit, H. T., 20, 21, 23, 285
Hollow-centered patterns, 156, 161, 162, 168, 174
  at 13 years, 261
Houses, representations of, 78, 79, 225–229
  age changes in, 227, 229, Plate 21
    tables, 37–39
  frequency of, 78, 79, 225–229
  sex differences in, 30
  type of, 227–229
Hurlbutt School, xii, 9

Ilg, F. L., 4, 6, 12, 156, 284, 285
Illustrations of characteristic patterns, at:
  2 years, 95, Plate 1
  3 years, 101, Plate 2
  4 years, 107, Plates 3, 4
  5 years, 113, Plate 5
  6 years, 119, Plate 6
  7 years, 125, Plate 7
  8 years, 133, Plate 8, 9
  9 years, 140, Plate 10
  10 years, 146, Plate 11
  11 years, 152, Plate 12
  12 years, 158, Plate 13
  13 years, 164, Plates 14, 15
  14 years, 170, Plate 16
  15 years, 176, Plate 17
  16 years, 214, Plate 18
Immaturity of response, 267, 268
Individual differences, 241–245
Individual subjects:
  age changes in response of, 242–245, 262–264
  variations of basic theme by, 242–244, Plates 30–32
Individuality:
  vs. age in Mosaic, 264, 265
  content and, 44
  as expressed by Mosiac, 5, 6, 40–44
    table of, 43
  factors of, at 12 years, 155
Intelligence:
  and Mosaic response, 4
    literature on, 25–29

Jagged products, 168

Kaleidoscope, 104, 136
Kerr, M., 20, 21, 30, 285
Kite design, 78, 79
"Kite" pattern, 57, 59
Kremer, M., xii, 284

LaLonde, G., 30, 285
Large (equilateral) triangle:
  age changes in use, 59–62
    figures illustrating, 59, 60
    sex differences in, 59, 61
    table of, 61
Lawrence, E. S., 21, 28, 29, 285
Learned, J., xii, 12, 284
Leland, L. A., 14, 16–18, 29, 30, 36, 39, 40, 262, 285, 286
Levin, M. L., 22, 285
Lining up of pieces, 98, 99
  See also Serial placement of pieces
Literature on Mosaic test:
  administration of, 20
  age changes in, 14–20
  classification, 31–37
  cultural differences, 38–41
  diagnosis, 22
  individuality, 41–44
  intelligence as measured by L.M.T., 27–29
  materials, 20

Literature on Mosaic test (*continued*)
  objective scoring, 25–27
  reliability, 20, 21
  scoring, 20, 25–27
  sex differences, 30
  validity, 21, 22
L.M.T. *See* Lowenfeld Mosaic Test
Longitudinal development, types of, 244, 245, 262–264
Longitudinal survey of individual subjects, 241–245, Plates 30–32
Lovett, S. K., xii
Lowenfeld, M., 3–5, 7, 10, 14, 20–25, 27, 29, 31–39, 41, 47, 50–52, 55, 57, 59, 73, 74, 77, 78, 215, 221, 224, 232, 262, 265–269, 284, 285
  age change table, 15
  system of classification, 24
Lowenfeld Mosaic Test:
  administration of, 11
  and age changes, 4–6
    See also Two years, Three years, *etc.*
  and developmental age, 4
  and developmental changes, 4, 5
  grammar of, 41
  and intelligence, 4
  interpretation of, 269
  literature on, 14–44
  material for, 10
  purpose of, 3, 4, 6, 282, 283
    compared with Rorschach, 3, 282, 283
  usefulness of, 3, 4, 6, 7, 268

Man. *See* Persons
Manic-depressive psychosis, 33
Manic states, 33
Martin, A. W., 285
Martinson, J., xii
Masculine symbols, 30, 79, 248–250
  table of, 249
  See also Phallic
Massing of pieces, 179, 180
Material for test, 10
  literature on, 20
Maturity, 6, 7
  See also Age changes, Age characteristics
Maturity factors, 5
McCulloch, T. L., 20, 27, 28, 285
McLeod, A., 32, 34, 285
Mead, M., 4, 285
Mead Johnson Co., xii
Mental defectives. *See* Retarded subjects
Mental disease:
  diagnosing with Mosaic, 32–35, 266
  See also Schizophrenia
Merry-go-round, 78, 79
Métraux, R. W., 284
Minnesota Scale of Socioeconomic Status, 10
Miss Gailer's School, 9
"Mixed" designs, 47–49, 53
  table of age changes in, 48, 49
  See also Tabular summary
Moran, M. J., 20, 285
Mosaic Conference, 20, 73
Mosaic test. *See* Lowenfeld Mosaic Test
Movement in patterns, 77, 130
  scoring of, 260

Naming of patterns, 75–79
  at different ages. *See* Two years, Three years, *etc.*
  level of naming, 75
    table of, 76
  as persons, 233
    table of, 233
  sex differences in, 78
  summary of, 271
  things named, 75–79
    sex differences in. *See* Sex differences, at different ages
      table of, 78, 79
  See also Quantitative analysis
Naturalistic use of color, 64, 65, 141, 147
Negative remarks, 151, 163, 169, 175, 213, 214
Neurotic pattern:
  at 15 years, 173
  at 16 years, 179
Neurotic personality shown by slabs, 223
Neurotic products, 24–26, 35–38
  abstracts among, 35
  characteristics of, 36
  color in, 36, 37
  in eighth graders, 36, 37
Neurotic response in children, 267
  table of, 267
Neurotic signs, 266
New Canaan Country Day School, xii, 9
Nine years, 134–140
  accompanying behavior, 139
  developmental table, 137
  faces, patterns representing, 232
  illustrations, 140, Plate 10
  percentage each type product, 134
  process of color use, 72
  qualitative analysis, 136
  quantitative analysis, 134
  sex differences, 134, 136, 138, 253
  tabular summary, 134
  variety of product, 136
  verbalization, 139
Non-neurotic products, 24
  in eighth graders, 36, 37
Nonrepresentational designs with pattern, 51
  color use in, 63, 64
  form level of, 55
    table of, 56
  table of age change in, 48, 49
  See also Tabular summary
Nonrepresentational designs without pattern, 50
  color use in, 63, 64
    table of, 64
  form level in, 55
    table of, 56
  table of age changes, 48, 49
  See also Tabular summary

Normal individual:
  characteristics expressed, 41–44
    Walker's table of, 45
  patterns of, 41–44
NORWALK SCHOOLS, xii, 9
Number of pieces used in Mosaics:
  at different ages, 80, 81
  sex differences in, 81
    See also Sex differences, at different ages
  summary of, 272
  table of, 80
  See also Quantitative analysis

Objective scoring:
  literature on, 26, 125–127
  suggestions for, 259–261
Objects, as representational designs, 47, 52
  at 3 years, 96
  at 4 years, 102
  at 5 years, 108
  at 6 years, 114
  at 7 years, 120
  at 8 years, 126
  at 9 years, 134
  at 10 years, 141
  at 11 years, 147
  at 12 years, 153
  at 13 years, 159
  at 14 years, 165
  at 15 years, 171
  at 16 years, 177
  illustrated, 107, 113, 119, 133, 140, 146, 152, 158, 164, 170, 176, 214, Plates 4–6, 9–18
  represented by single piece, 162
  tables of, 48, 49
Off-center patterns at 15 years, 173
Old people. *See* Elderly subjects
OLSEN, P., xii
Optical illusion, 137
Organic disease:
  products of patients with, 25, 26, 31, 32
    color use in, 37
  signs, 266
Organic injury in children, signs of, 267
Over-all design, 47, 50, 51, 108, 114, 126, 134, 141, 147, 153, 159, 165, 171, 177
  tables, 48, 49
Overclassification, 259

PASCAL, G. M., 285
Pattern filling tray, 51
  table, 48, 49
Patterns, type of. *See* Design
PELZ, K., 263, 265
People. *See* Faces, Persons
Percentage each type of product, at:
  2 years, 91
  3 years, 96
  4 years, 102
  5 years, 108
  6 years, 114
  7 years, 120
Percentage each type of product, at (*continued*)
  8 years, 126
  9 years, 134
  10 years, 141
  11 years, 147
  12 years, 153
  13 years, 159
  14 years, 165
  15 years, 171
  16 years, 177
Perseveration, 156
Personality:
  characteristics revealed, 41, 42
    Walker's table of, 43
  and content, 44
  as expressed by Mosaic, 39–44, 241–245
  patterns, 5, 6
  See also Individuality
Persons, representations of, 78, 79, 172, 173, 229–233
  age changes in, 232
    table, 232
  frequency of, 229
  kinds made, 232
    table, 232
  naming, 233
    table, 233
  See also Faces
Phallic-looking objects, 129, 127, 150
Phallic-shaped figures, 248
  table of, 250
Piece, single, standing for object, 162
Pieces:
  returned to box at 9 years, 140
  used as paint, 57, 110, 116
PIKE, F., 263, 285
Piling of pieces, 48, 50, 91–93, 96, 102, 179, 180
  illustrated, 95, Plate 1
Points, emphasis of, 168, 174
Prefundamental, 47, 50, 91, 93, 96, 102
  illustrated, 101, 107, Plates 2, 3
  tables, 48, 49
Primary system of thought, 23
Procedure for giving test, 11
Process of color use, age changes in, 70–73
Process vs. product, 259
Products:
  formal properties of, 47–79, 270–272
    color, 63–74
    compactness, 84–87
    content, 30, 75–79
    form level, 55-62
    literature on, 22–25
    naming, 75–79
    number of pieces, 80
    shape used, 59–62
    success of patterns, 87–89
    symmetry, 82–84
    systems of classification, 22–24
    timing, 81, 82
    type of. *See* Design

Products (*continued*)
  type of structure, 30, 47–49
    mixed, 53
    nonrepresentational
      with pattern, 51
      without pattern, 50
    representational, 52
    table of, 48, 49
Properties, formal, of products. *See* Products
Psychological Corporation, 10
Psychopaths, 35
Psychosis. *See* Mental disease
Pulling in at 13 years, 161
Pyramids, representations of, 78, 79

Qualitative analysis:
  at 2 years, 92
  at 3 years, 97
  at 4 years, 103
  at 5 years, 110
  at 6 years, 116
  at 7 years, 122
  at 8 years, 128
  at 9 years, 136
  at 10 years, 143
  at 11 years, 149
  at 12 years, 155
  at 13 years, 161
  at 14 years, 167
  at 15 years, 173
  at 16 years, 179
Qualitative evaluation, 5
  See also Individuality
Quantitative analysis, 4, 5, 261
  at 2 years, 91
  at 3 years, 96
  at 4 years, 102
  at 5 years, 108
  at 6 years, 114
  at 7 years, 120
  at 8 years, 126
  at 9 years, 134
  at 10 years, 141
  at 11 years, 147
  at 12 years, 153
  at 13 years, 159
  at 14 years, 165
  at 15 years, 171
  at 16 years, 177
Quietness of 13 years, 163

Rate of growth, indications of, 263
Reciprocal interweaving, 264
Recording accompanying behavior, 265, 266
Red, use of:
  and black at 15 years, 173
  at different ages, 66–70
    figure illustrating, 67, 68
    table of, 66
  in neurotic patterns, 36
  significance of, 74
Reiman, G., 20, 23, 28, 29, 30, 38, 285
Reliability, of test, literature on, 20, 21
Representational designs, 52
  color use in, 63, 65
    table of, 65
  form level in, 56–59
    table of, 58
  table of age changes in, 48, 49
  See also Tabular summary
Retarded subjects:
  products of, 20, 27–29
    color in, 29
"Rhinoceros" pattern, 57, 59
Rioch, M. J., 22, 285
Road, products named as, 78, 79, 248–250
Rocket, 78, 79, 248–250
  See also Masculine symbols
Rorschach test, 4, 14, 36, 155, 179, 180, 241, 263–265, 267, 268, 282, 283
  in children, 5
  developmental study of, 5, 6
  D% at 11 years, 149
  purpose of, 3, 282
    compared with Mosaic, 3, 282
  scoring of, 259–261

Scalene triangle:
  age change in use, 59–62
    figure illustrating, 59, 60
    sex differences in use, 59, 60
    table of, 61
  at 15 years, 173, 174
Scattered patterns at 11 years, 149, 150, 261
Scattering of pieces, 50
  illustrated, 95, 101, Plates 1, 2
  singly, 48, 91, 93, 96, 102
Scenes, 47, 52, 78, 79, 233–238, Plates, 26, 27
  age changes in number of, 234
  at 3 years, 96
  at 4 years, 102
  at 5 years, 108
  at 6 years, 114
  at 7 years, 120
  at 8 years, 126
  at 9 years, 134
  at 10 years, 141
  at 11 years, 147
  at 12 years, 153
  at 13 years, 159
  at 14 years, 165
  at 15 years, 171
  at 16 years, 177
  illustrated, 107, 113, 119, 125, 133, 140, 146, 158, 164, 170, 176, 214, Plates 4–11, 13, 15–17, 26, 27
  number of, 233
    table of, 234
  qualitative description of, tables, 235–237
  sex differences in, 233–238
    tables, 235–237
  size of, 233–238
  tables of, 48, 49
Schizophrenia:
  color use in, 33, 37
  levels of, 33, 34
  products, 25, 26, 33–35

Schizophrenia (*continued*)
  signs, 266
  stages of, 33, 34
School readiness, 268
SCHMALE, H. T., 20, 21, 23, 25, 29, 30, 32–35, 284
Scoring of Mosaic test:
  compared to Rorschach scoring, 259–261
  literature on, 25–27
  objective, 26, 125–127
    suggestions for, 259–261
Secondary system of thought, 23
Self-criticism. *See* Criticism
Separate designs, 48, 49, 52, 96, 102, 108, 114, 120, 126, 134, 141, 147, 153, 159, 165, 171, 177
  table, 48, 49
Serial placement of pieces:
  illustrated, 125, Plate 7
  at 7 years, 122, 124, 130, 261
  at 9 years, 137
Seven years, 6, 120–125
  accompanying behavior, 124
  developmental table, 123
  illustrations, 125, Plate 7
  percentage each type product, 120
  process of color use, 72
  qualitative analysis, 122
  quantitative analysis, 120
  serial placement, 122, 124, 130, 261
  sex differences, 120, 122, 124, 253
  tabular summary, 120
  verbalization, 124
Sex differences, 246–256
  at different ages:
    2 years, 91, 99, 94, 252
    3 years, 96, 97, 99, 252
    4 years, 102, 103, 105, 252
    5 years, 108, 110, 111, 252
    6 years, 114, 116, 118, 252
    7 years, 120, 122, 124, 253
    8 years, 126, 128, 131, 253
    9 years, 134, 136, 138, 253
    10 years, 141, 143, 145, 253
    11 years, 147, 149, 151, 254
    12 years, 153, 155, 156, 254
    13 years, 159, 161, 162, 254
    14 years, 165, 167, 168, 255
    15 years, 171, 173, 174, 255
    16 years, 177, 179, 180, 255
  in center designs, 255
  in characteristicness of response, 251
  in color use, 63–70, 247
  in compactness of design, 251
  in content of design, 30, 75–79, 248
    table, 249
  in eighth-grade subjects, 17
  in form level, 56, 57, 246
  literature on, 30
  in naming products, 75
  in number of pieces used, 80
  in quality of scenes, 235–238
  in shapes used, 59–62, 247
  in slab patterns, 216, 248
Sex differences (*continued*)
  in success of design, 88
  summary of, 256, 272
  in symmetry of products, 84, 251
  in time required for completion of product, 82, 251
  in type of design, 30, 47, 246
Sexes, alike at 14 years, 167, 168
Shapes, 6, 59–62
  number used in slabs, 218, 219
  used at different ages, 59–62
    figure illustrating, 59, 60
    sex differences in, 59–62, 247
      See also Sex differences, at different ages
    table of, 61
    See Quantitative analysis
  See also Diamond shape, Square shape, and various kinds of triangles
Sharp outlines at 13 years, 161, 162, 168, 174, 180, 261
SHOTWELL, A., 21, 28, 29, 285
Sidewalk, products named as, 75
Silly behavior, 106, 112, 131
Six years, 6, 114–119
  accompanying behavior, 118
  developmental table, 117
  illustrations, 119, Plate 6
  patterns, 19
    table of, 16
  percent each type product, 114
  process of color use, 71
  qualitative analysis, 116
  quantitative analysis, 114
  sex differences, 114, 116, 118, 252
  tabular summary, 114
  verbalization, 118
Sixteen years, 177–182
  accompanying behavior, 213
  apathy, 213, 214
  developmental table, 180
  enthusiasm, 214
  illustrations, 214, Plate 18
  neurotic patterns at, 179
  percentage each type product, 177
  qualitative analysis, 179
  quantitative analysis, 177
  resemblance to 10 years, 180
  sex differences, 177, 179, 180, 255
  tabular summary, 177
  verbalization, 213
Sky, products named as, 78, 79
Slabs, 47, 50, 55, 91, 96, 102, 108, 114, 120, 126, 134, 141, 147, 153, 159, 165, 171, 215–224
  accuracy of fit, 216–218
  aesthetic appearance of, 221
  age changes in use of, 216
    table, 216
  colors used, 218, 219
  fitting of, 221, 222
    table, 222
  frequency of, at 12 years, 155, 156

Slabs (*continued*)
  illustrated, 146, 158, 164, Plates, 11, 13, 14, 20
  indicating neurotic personality, 223
  interpretation of, 224
  large, 48, 49
  literature on, 15, 17, 24, 31, 37, 39
  number of, 218
  number of colors used, 218, 219
    table, 219
  number of pieces used, 219
  number of shapes used, 218, 219
    table, 219
  scoring, 260
  shapes used, 217, 220
  size of, 219, 220
    table, 220
  small, 47
  at successive ages, 221
  summary of use of, 223
  unsuccessful, 215
Small (isosceles) triangle:
  age changes in use, 59–62
    figure illustrating, 59, 60
    sex differences in, 59, 60
    table of, 61
Square shape:
  age changes in use, 59–62
    figure illustrating, 59, 60
    sex differences in, 59, 60
    table of, 61
  predominance at 10 years, 144
  products at 10 years, 261
Stability of child, indications from test, 42, 43, 260
Stern, E., 285
Stewart, U., 14, 16–18, 29, 30, 36, 39, 40, 262, 285, 286
Stonebound designs, 31
Strieter, E., 14, 17, 36, 286
Structure, type of, 47–54, 270
  tables, 48, 49
  See also Design
Subjects for test, 9–11
  intelligence of, 9
  socioeconomic status of, 10
  source of, 9
Success of products, 55, 87
Summerton, E., xii
Sun, representations of, 78, 79
Surgency, 42, 43, 260
Symmetry of products, 82–84
  at fourteen years, 166, 167, 261
  placement, 82
  sex differences in, 84, 251
    See also Sex differences, at different ages
  summary of, 271
  table of, 82
  See also Asymmetric patterns, Quantitative analysis

Tabular summary, type of design at:
  2 years, 91
  3 years, 96
Tabular summary type of design at (*continued*)
  4 years, 102
  5 years, 108
  6 years, 114
  7 years, 120
  8 years, 126
  9 years, 134
  10 years, 141
  11 years, 147
  12 years, 153
  13 years, 159
  14 years, 165
  15 years, 171
  16 years, 177
Teasing manner of 12-year-olds, 157
Ten years, 141–146
  accompanying behavior, 146
  bulkiness of products, 143
  developmental table, 144
  illustrations, 146, Plate 11
  percentage each type product, 141
  process of color use, 73
  qualitative analysis, 143
  quantitative analysis, 141
  resemblance to 16 years, 180
  sex differences, 141, 143, 145, 253
  square, strong use of, 144, 261
  tabular summary, 141
  variety of products, 143
  verbalization, 146
Thematic Apperception Test, 14
Thirteen years, 6, 7, 159–164
  accompanying behavior, 163
  developmental table, 162
  illustrations, 164, Plate 14, 15
  patterns, table of, 17
  percentage each type product, 159
  pulling in, 161
  qualitative analysis, 161
  quantitative analysis, 159
  quietness of, 163
  sex differences, 159, 161, 162, 254
  sharp outlines, 161, 261
  small hollow circles, 161, 254, 261
  tabular summary, 159
  verbalization, 163
Three years, 6, 96–101
  accompanying behavior, 100
  developmental table, 99
  illustrations, 101, Plate 2
  percentage each type product, 96
  process of color use, 71
  qualitative analysis, 97
  quantitative analysis, 96
  sex differences, 96, 97, 252
  tabular summary, 96
  verbalization, 100
Timing, 81, 82
  at different ages. *See* Two years, Three years, *etc.*
  sex differences in, 81, 251
    See also Sex differences, at different ages
  table of, 82
  See also Quantitative analysis

Train, representations of, 78, 79, 248–250
  See also Masculine symbols
Tray, design filling. *See* Design, filling tray
Trees, representations of, 78, 79, 227–231, Plate 22
  age changes in, 227, 230, 231
    table, 230
  See also Feminine symbols
Triangle. *See* Large (equilateral) triangle, Scalene triangle, Small (isosceles) triangle
Twelve years, 6, 7, 153–158
  accompanying behavior, 157
  developmental table, 156
  illustrations, 158, Plate 13
  percent each type product, 153
  perseveration, 156
  personality, 156
  process of color use, 73
  qualitative analysis, 155
  quantitative analysis, 153
  sex differences, 153, 155, 156, 254
  tabular summary, 153
  teasing manner, 157
  verbalization, 157
Two years, 91–95
  accompanying behavior, 94
  developmental table, 93
  illustrations, 95, Plate 1
  percentage each type product, 91
  process of color use, 70
  qualitative analysis, 92
  quantitative analysis, 91
  sex differences, 91, 92, 94, 254
  tabular summary, 91
  verbalization, 94

Usefulness of Mosaic Test, 268

Validity of test, literature on, 21, 22
Variability of product:
  at 8 years, 128, 129
  at 9 years, 136
  at 10 years, 143
  at 15 years, 173
Variation on basic theme:
  in individual subjects, 242–244, Plates 30–32
Variety. *See* Variability of product
Verbalization, at:
  2 years, 94
  3 years, 100
Verbalization, at (*continued*)
  4 years, 106
  5 years, 112
  6 years, 118
  7 years, 124
  8 years, 131
  9 years, 139
  10 years, 146
  11 years, 151
  12 years, 157
  13 years, 163
  14 years, 169
  15 years, 175
  16 years, 213

Walker, R. N., xii, 12, 18, 19–23, 30, 42–44, 47, 52, 63, 284, 286
  dichotomies of, 260
  table of individuality characteristics, 43
Washington Mosaic Conference, 20, 73
Water, 78, 79
Wechsler-Bellevue Test, 29
Wertham, F., 20, 22, 23, 24, 28, 29, 31–34, 50, 266, 286
Whirling design, 138, 144, 173, 174
White, use of:
  at different ages, 66–70
    figures illustrating, 67, 68
    table of, 66
  in neurotic patterns, 36
  significance of, 74
Whole pattern, 47, 52, 102, 108, 114, 120, 126, 134, 141, 147, 153, 159, 165, 171, 177
  table, 48, 49
Wideman, H., 25, 26, 30, 37, 39, 260, 266, 286
  objective scoring system of, 25–27
Winged patterns, 35
Withdrawal, 6, 7
Woolf, H., 29, 286
Wrong, E., 29, 286

Yellow, use of
  and black, 73, 161
  at different ages, 66–70
    figures illustrating, 67, 68
    table of, 66
  in neurotic patterns, 36
  significance of, 74

Zucker, L., 20, 286

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